UPDATE EXISTING EEAP

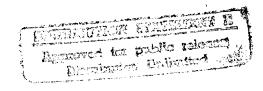
FORT CARSON COLORADO SPRINGS, COLORADO

Prepared for

DEPARTMENT OF THE ARMY U.S. ARMY CORPS OF ENGINEERS, OMAHA DISTRICT OMAHA, NEBRASKA

Under

CONTRACT DACA45-91-D-0009 EMC No. 2102-001



July 1993



By

E M C ENGINEERS, INC. 2750 S. Wadsworth Blvd., Suite C-200 Denver, Colorado 80227 303/988-2951 This report has been prepared at the request of the client, and the observations, conclusions, and recommendations contained herein constitute the opinions of E M C Engineers, Inc. In preparing this report, EMC has relied on some information supplied by the client, the client's employees, and others which we gratefully acknowledge. Because no warranties were given with this source of information, E M C Engineers, Inc. cannot make certification or give assurances except as explicitly defined in this report.

DEPARTMENT OF THE ARMY

CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS
P.O. BOX 9005
CHAMPAIGN, ILLINOIS 61826-9005

REPLY TO ATTENTION OF:

TR-I Library

17 Sep 1997

Based on SOW, these Energy Studies are unclassified/unlimited. Distribution A. Approved for public release.

Marie Wakeffeld,

Librarian Engineering

TABLE OF CONTENTS

<u>Section</u>			<u>Page</u>
List of	Abbre	viations	v
EXECU	TIVE	SUMMARY	ES-1
1.0	INTR	RODUCTION	
	1.1	Authority	1-1
	1.2	Purpose	
	1.3	Scope of Work	
	1.4	Organization of the Report	
	1.5	ECOs To Be Evaluated	1-2
	1.6	Approach	
		1.6.1 ECO Reevaluations	1-4
		1.6.2 Conserval Solarwall Evaluations	1-4
		1.6.3 HVAC Controls Surveys	
	1.7	Economic Analysis	1-5
	1.8	Persons Responsible for the Work	1-5
	1.9	Work Accomplished to Date	1-6
	1.10	Plan for Completing the Work	1-6
2.0	HIST	ORICAL ENERGY DATA	
	2.1	Historical Energy Consumption	2-1
	2.2	Unit Energy Prices	2-1
3.0	EVA	LUATION OF THE CONSERVAL SOLARWALL	
	3.1	General	3-1
	3.2	Building P-1160: Gymnasium	3-1
	3.3	Building P-2357: Gymnasium	3-3
	3.4	Building P-8030: T.O.E. Maintenance Facility	3-4
	3.5	Building P-8142: Vehicle Maintenance Facility	3-5
	3.6	Building P-8300: D/S Maintenence Facility	3-6
4.0	UPD	ATE OF ANALYSIS OF ECOs	
	4.1	ECO 13: Motor Replacement	4-1
	4.2	ECO 14: Night Setback Thermostats	4-3
	4.3	ECO 16: Dry Bulb Economizers	4-4
	4.4	ECO 19: Automatic Radiator Controls	4-5
	4.5	Recommendations With Regard to ECIP Projects	
5.0	HEA	TING AND COOLING EQUIPMENT DISCREPANCIES	
	5.1	General	5-1
•	5.2	Inspection Procedures	5-1
	5.3	Repair Cost Estimates	5-3

TABLE OF CONTENTS (Concluded)

APPENDICES

A	Scope of Work, Confirmation Notices
В	Backup Data, Conserval Solarwall
C	LCCA, Calculations, and Backup Data for ECOs 13, 14, 16, 19
D	Heating and Cooling Equipment Discrepancies, and Building Survey Forms

LIST OF TABLES

<u>Table</u>		Page
ES-1 ES-2 ES-3 ES-4 ES-5	Buildings Designated for ECO Evaluations Prioritized ECO Summary Solarwall Analysis Summary Buildings Inspected for Equipment Discrepancies Equipment Repair Cost Estimate Summary	ES-2 ES-2 ES-4
1-1	Buildings Designated for ECO Evaluations	1-3
2-1	Historical Utility Consumption and Cost Data	2-2
4-1 4-2 4-3	ECO 13: Energy Savings Summary ECO 13: Economic Summary ECO 14: Summary of Results	4-3
4-4	ECO 16: Summary of Results	4-5
4-5	ECO 19: Summary of Results	4-6
4-6	Prioritized ECO Summary	4-7

LIST OF ABBREVIATIONS

AHU - air handling unit

AIRR - adjusted internal rate of return

ASHRAE - American Society of Heating, Refrigeration, and Air Conditioning Engineers

Bldg - Building

cfm - cubic feet per minute

EA - each

ECIP - Energy Conservation Investment Program: An element of the Military

Construction Army funding authority specifically set aside for energy

conservation projects that meet specified economic criteria.

ECO - Energy Conservation Opportunity

EMC - E M C Engineers, Inc.

F - Fahrenheit

ft - foot, feet

ft² - square feet

ft³ - cubic feet

FY - the federal fiscal year

hr - hour(s)

H&V - heating and ventilating

HVAC - heating, ventilating, and air conditioning

Investmt - investment

kcf - thousands of cubic feet

kW - kilowatt, one thousand watts

kWh - kilowatt-hour, one thousand watthours

LCCA - Life Cycle Cost Analysis

MBtu - British thermal units (million)

No. - number

SF - square feet

SIR - Savings-to-Investment Ratio: Total life cycle benefits divided by 90% of the

differential investment cost.

SPB - simple payback: The project investment cost divided by the sum of the

annual energy and maintenance cost savings

UCS

utility control system: a computer-based system including Direct Digital
 Controls used for the control of building conditioning equipment and utility systems

U.S.

- United States

U-value

- A coefficient expressing the thermal conductance of a composite structure in Btu per (sq ft) (hour) (degrees F temperature difference); Btu/(ft² x hr x °F).

W

- watt(s)

yr

- year(s)

EXECUTIVE SUMMARY

GENERAL

This study reevaluates three Energy Conservation Opportunities (ECOs) from a 1985 study, evaluates the application of the Conserval Solarwall active solar system on five buildings, and estimates the cost of repair to heating and cooling equipment temperature controls on 82 buildings.

ECO EVALUATIONS

Certain HVAC control system ECOs were studied in 1985 by Forster-Morrell Engineering Associates, Inc, and qualified at that time for implementation under the Energy Conservation Investment Program (ECIP). However, funding for ECIP projects was discontinued before the projects could be implemented. Now that the funding has been restored, it is necessary to requalify the ECOs using current energy prices and current ECIP guidance for life cycle cost analysis. This was done in this study of the following ECOs:

- ECO 13: Replace standard motors with high efficiency motors.
- ECO 14: Install night setback thermostats.
- ECO 16: Install dry bulb economizers on air handling units.
- ECO 19: Install automatic thermostats on steam radiators.

The buildings designated for reevaluation of the ECOs are presented in Table ES-1 below.

TABLE ES-1
BUILDINGS DESIGNATED FOR ECO EVALUATIONS

ECO NO.	Designated Buildings
13	P-1853, P-1950. P-1951, P-1952, P-1953, P-1954, P-2050, P-2051, P-2052, P-2054, P-2060, P-2070, P-2071, P-2072, P-2073, P-2074, P-2150, P-2151, P-2152, P-2153, P-2154, P-2160, P-2250, P-2251, P-2252, P-2253, P-2254, P-2350, P-2352, P-2450, P-2451, P-2452, P-2453, P-2454, P-2700, P-8000, P-8030, P-8142
14	P-1007, P-1955, P-1956, P-2055, P-2056, P-2155, P-2156, P-2700
16	P-1850, P-2359
19	S-6220, S-6221, S-6222, S-6223, S-6224, S-6233, S-6236, S-6237, S-6243, S-6230, S-6231, S-6234, S-6235, S-6240, S-6241, S-6244, S-6252, S-6253, S-6254, S-6255

The results of the evaluations are presented in Table ES-2 below.

TABLE ES-2 PRIORITIZED ECO SUMMARY

ECO No.	Electric Energy Savings (MBtu/yr)	Gas Energy Savings (MBtu/yr)	Investmt Cost (\$)	Electric Cost Savings (\$/yr)	Gas Cost Savings (\$/yr)	SPB (yrs)	SIR	AIRR %
14	22	2,631	5,974	377	9,145	0.6	22.4	28.0
16	0	308	8,697	0	1,070	8.1	2.3	8.4
13	846	0	92,418	8,944	0	7.4	2.0	7.7
19	0	9,875	263,997	0	34,325	7.7	1.8	8.3
ALL			,		చింది. మన్న			
ECOs	868	12,814	371,086	9,104	-53,645	6.5	2.7	9.4

SOLAR WALL ANALYSIS

A proprietary application of active solar energy technology to industrial buildings has been developed by Conserval Engineering, Inc. of Canada. The Conserval Solarwall is presently under consideration for installation at the AVUM hangar at Butts Army Air field. The application of the technology was evaluated for Buildings P-1160, P-2357, P-8030, P-8142 and P-8300 with unfavorable results. The application of the Conserval Solarwall is not cost effective at any of the five buildings and is not recommended.

TABLE ES-3 SOLARWALL ANALYSIS SUMMARY

Bldg No.	Gas Energy Savings (MBtu/yr)	First Cost (\$)	Gas Cost Savings (\$/yr)	SPB	SIR	AIRR %
P-2359	126	9,354	626	14.9	0.6	-0.6
P-8300	325	38,835	1,617	24.0	0.4	-5.2
P-8142	231	30,197	1,146	26.3	0.4	-6.1
P-1160	108	19,867	535	37.1	0.3	-9.2
P-8030	957	253,181	4,727	54.0	0.2	-12.5

HEATING AND COOLING EQUIPMENT REPAIRS

The existing pneumatic and electric temperature controls are scheduled to be replaced with Direct Digital Controls (DDC) in a number of buildings at Fort Carson. The heating and cooling coil control valves and modulating air flow dampers will remain either pneumatically or electrically actuated as currently configured. In order for the new DDC systems to function properly, it is necessary for the valves and dampers and their actuators to be in good operating condition with substantial remaining service life. These components were inspected for condition, and necessary repair and replacement actions were identified for each of the 82 buildings listed in Table ES-4.

In general the heating and cooling equipment is well maintained, but most of the heating and cooling coil control valves and valve actuators are near the end of their expected service lives. If the UCS project proceeds to construction, the repairs and replacements identified in this report should be made at the time of construction.

Table ES-5 lists the cost of repair and replacement for each of the 18 groups of buildings identified in Table ES-4.

TABLE ES-4 BUILDINGS INSPECTED FOR EQUIPMENT DISCREPANCIES

Group							
No.	Building Nos.						
1	P-1950, P-2070, P-2153, P-2250						
2	P-1951, P-1952, P-1953, P-1954, P-2050, P-2051, P-2052, P-2054, P-2078, P-2071, P-2072, P-2073, P-2074, P-2150, P-2151, P-2152, P-2154, P-2251, P-2252, P-2253, P-2254, P-2450, P-2451, P-2452, P-2453, P-2454						
3	P-1007, P-1150						
4	P-1118, P-1217, P-1218, P-1219, P-1220, P-1363, P-1364, P-1365, P-1366, P-1367, P-1664, P-1665, P-1666, P-1667						
5	P-1227						
6	P-1446						
7	P-1526						
8	P-1528						
9	P-1855						
10	P-1864						
11	P-1955, P-1956, P-2055, P-2056, P-2155, P-2156						
12	P-1957, P-1958, P-2057, P-2058, P-2157, P-2158, P-2257, P-2258, P-2457, P-2458, P-2557, P-2558						
13	P-1853, P-2060, P-2160, P-2350, P-2352, P-2700						
14	P-2357						
15	P-1850, P-2359						
16	P-8000						
17	P-8030						
18	P-8142						

TABLE ES-5
EQUIPMENT REPAIR COST SUMMARY

Bldg Group No.	Labor Cost (\$)	Material Cost (\$)	Total Cost (\$)
1	1,720	7,824	9,545
2	10,513	88,112	98,624
3	956	6,385	7,341
4	11,507	60,834	72,341
5	478	3,193	3,670
6	707	<i>7,</i> 585	8,293
7	765	4,687	5,451
8	0	0	0
9	1,013	6,401	7,414
10	1,032	10,869	11,902
11	1,720	10,623	12,343
12	3,441	15,337	18,778
13	2,485	13,814	16,299
14	. 2,370	15,547	17,918
15	1,109	8,682	9,791
16	1,319	9,811	11,130
17	593	3,274	3,866
18	745	4,784	5,530
Total	42,472	277,764	320,236

RECOMMENDATIONS

ECO 13 - Motor Replacement: Replacing standard drive motors with high efficiency motors is cost effective, as shown in Table ES-2 on page ES-2. The \$92,418 investment cost has an AIRR of 7.7% and an SIR of 4.1, which gives this project a medium priority. The motors should be replaced as soon as funding permits. As a result of the study, it is recommended that a motor replacement policy be established at Fort Carson to routinely replace all failed standard motors with high efficiency motors. This will reduce the electrical demand, save energy, increase motor service life, and lower maintenance costs over the life of the motors.

ECO 14 - Night Setback Thermostats: This ECO is one of the most cost effective ways of reducing energy consumption. The investment cost is only \$5,974 and the AIRR is 28%. The payback is just one heating season. It is recommended for implementation with a high priority.

ECO 16 - Dry Bulb Economizers: The investment cost is \$8,697 with a payback in 8.1 years, an SIR of 2.3, and an AIRR of 8.4%. Only two buildings are included in this ECO. It is recommended for implementation with a medium priority.

ECO 19 - Automatic Radiator Control Valves: This ECO is the least cost effective of the 4 ECOs evaluated, primarily because of the very large number of radiators in the 17 buildings in the old hospital complex. There are a total of 1,824 radiators to be retrofitted with steam control valves and wall-mounted thermostats. The payback for the \$263,977 investment cost is 7.7 years, with an AIRR of 8.3%. This ECO is recommended, with a medium priority, for implementation.

The total investment cost of all qualifying ECOs is \$371,086 which exceeds the \$300,000 ECIP project threshold limit. Therefore, it is possible to submit the 4 qualifying ECOs as an ECIP project without combining them with other energy projects at Fort Carson. However, the total project SPB of 6.5 years is marginally competitive. It is recommended that cost effective energy conservation projects already identified in other projects, such as for Evans Army Hospital, be combined with those from this study into a single ECIP project to reduce the SPB. This would improve the probability of obtaining ECIP funding. For such an ECIP project it would be necessary to reevaluate the economic effectiveness of the Evans Hospital ECOs using the current ECIP guidance. Program documentation would have to be prepared for the ECIP project.

<u>Conserval Solarwall</u>: This proprietary technology appears to make a lot of sense for new construction of industrial buildings with high ventilation rates and long operating schedules, but it is not cost effective for any of the 5 buildings evaluated, and is not recommended.

Heating and Cooling Equipment Repairs: This evaluation does not involve energy savings, but rather identifies the temperature control elements that should be replaced on 82 buildings in the event a UCS is installed to control the buildings as planned. The cost of \$320,236 is

in the event a UCS is installed to control the buildings as planned. The cost of \$320,236 is necessary in order to insure the new Direct Digital Controls will be effective in controlling space temperatures.

The heating and cooling coil control valves will have to replaced sometime in the next few years because they are near the end of the expected service life. Replacing them all as a single project will improve space temperature control and reduce maintenance costs over the next several years. The replacement should be done as a single project in the event the UCS project proceeds to construction. Otherwise, the control components may be replaced at the time of failure.

SECTION 1.0

INTRODUCTION

1.1 AUTHORITY

This study was conducted under the authority of Contract No. DACA45-91-D-0009 which was issued and administered by the U.S. Army Corps of Engineers, Omaha District.

1.2 PURPOSE

The purpose of this study is to:

- Reevaluate selected Energy Conservation Opportunities (ECOs) from a previous study.
- Evaluate the application of new solar technology to selected buildings.
- Determine the operational status of controls on air handling units designated for conversion to Direct Digital Controls (DDC) as part of a planned Utility Control System (UCS) construction project.

1.3 SCOPE OF WORK

The Revised Scope of Work, dated January 20, 1993, is included in Appendix A. It contains three major elements:

- 1. Update the evaluations of four ECOs from a previous study, Energy Savings Opportunity Survey, Fort Carson, 1985, by Forster-Morrell Engineering Associates, Inc.,
- 2. Evaluate the application of the Conserval Solarwall to five designated buildings,
- 3. Inspect heating and cooling equipment in buildings designated for installation of DDC to identify deficiencies that require correction prior to the installation of a planned UCS.

The reevaluation of the designated ECOs and the evaluation of the Conserval Solarwall are made in accordance with the October 1992 ECIP guidance, and with current unit energy prices and estimated construction costs.

1.4 ORGANIZATION OF THE REPORT

This report is submitted in one volume:

- Historical consumption data and current unit prices of electricity and natural gas are presented in Section 2.0.
- Section 3.0 presents the evaluations of the Conserval Solarwall applied to five buildings.
- Section 4.0 presents the results of the reevaluations of the four designated ECOs from the previous study.
- Section 5.0 presents the findings of the inspection of heating and cooling equipment and controls designated for conversion to DDC.
- Appendix A contains the Scope of Work and pertinent confirmation notices pertaining to the Scope of Work.
- Backup calculations and supporting data are included in Appendices B and C for report Sections 3 and 4, respectively.
- Building survey forms are included in Appendix D. For most of the buildings included in this study, the survey forms from the 1985 study were used, and changes in data are indicated directly on the original forms.

1.5 ECOs TO BE REEVALUATED

The four ECOs from the 1985 study to be reevaluated are:

- ECO 13: Replace standard motors with high efficiency motors (Motor Replacement)
- ECO 14: Install night setback thermostats (Night Setback)
- ECO 16: Install dry bulb air economizers on air handling units (Economizer Cycle)
- ECO 19: Install automatic thermostats on steam radiators (Radiator Controls)

The application of the above ECOs to specific buildings is presented in Table 1-1.

Annex A of the original Scope of Work (Appendix A, page A-11) called for the reevaluation of ECO 31: Revise or Repair HVAC Controls. This ECO definition originated in the 1985 study and involved energy savings from incorporating new temperature control features such as time clocks, setback thermostats, optimized hot and cold deck reset, etc.

During the analysis of ECO 31, it was determined that the very control functions included in ECO 31 were the same control functions included in a concurrent construction project, the utility control system (UCS), scheduled for construction at Fort Carson.

This conflict was resolved by the January 20, 1993 revision of Annex A of the Scope of Work (Appendix A, page A-21), which changed the definition of ECO 31. It was redefined to inspect HVAC units in the designated buildings for discrepancies that should be repaired before the units are converted to DDC under the UCS project. In effect, ECO 31 was redefined so that it is not an ECO. The repairs will generally not result in energy savings, but will return the HVAC units to full operability before conversion to DDC. Eighty-two buildings are designated for inspection as listed in Table 1-1.

TABLE 1-1
BUILDINGS DESIGNATED FOR ECO EVALUATIONS

ECO No.	Description	Designated Buildings
13	Motor Replacement	P-1853, P-1950. P-1951, P-1952, P-1953, P-1954, P-2050, P-2051, P-2052, P-2054, P-2060, P-2070, P-2071, P-2072, P-2073, P-2074, P-2150, P-2151, P-2152, P-2153, P-2154, P-2160, P-2250, P-2251, P-2252, P-2253, P-2254, P-2350, P-2352, P-2450, P-2451, P-2452, P-2453, P-2454, P-2700, P-8000, P-8030, P-8142
14	Night Setback	P-1007, P-1955, P-1956, P-2055, P-2056, P-2155, P-2156, P-2700
16	Economizer Cycle	P-1850, P-2359
19	Radiator Controls	S-6220, S-6221, S-6222, S-6223, S-6224, S-6233, S-6236, S-6237, S-6243, S-6230, S-6231, S-6234, S-6235, S-6240, S-6241, S-6244, S-6252, S-6253, S-6254, S-6255
(formerly ECO 31)	Equipment Repairs	P-1007, P-1118, P-1150, P-1217, P-1218, P-1219, P-1220, P-1227, P-1363, P-1364, P-1365, P-1366, P-1367, P-1446, P-1526, P-1528, P-1664, P-1665, P-1666, P-1667, P-1850, P-1853, P-1855, P-1856, P-1864, P-1950, P-1951, P-1952, P-1953, P-1954, P-1955, P-1956, P-1957, P-1958, P-2050, P-2051, P-2052, P-2054, P-2055, P-2056, P-2057, P-2058, P-2060, P-2070, P-2071, P-2072, P-2073, P-2074, P-2150, P-2151, P-2152, P-2153, P-2154, P-2155, P-2156, P-2157, P-2158, P-2160, P-2250, P-2251, P-2252, P-2253, P-2254, P-2257, P-2258, P-2350, P-2352, P-2357, P-2359, P-2450, P-2451, P-2452, P-2453, P-2454, P-2457, P-2458, P-2557, P-2558, P-2700, P-8000, P-8030, P-8142

1.6 APPROACH

1.6.1 ECO Reevaluations

The original ECO evaluations in the 1985 study were reviewed for approach and results. Applicable buildings were inspected and surveyed for changes in functional use, operating schedules, occupancy, modifications to the thermal characteristics of construction, and for modifications to the HVAC systems. Where changes invalidated the energy savings calculated in the original study, new baseline and ECO energy consumptions were calculated using the Bin Chart Energy Program (BCEP), which was used in the 1985 study. ECO economic reevaluations were made in every case using the latest ECIP guidance, current construction cost estimates and current unit energy prices.

1.6.2 Conserval Solarwall Evaluations

Before starting the evaluations of the application of the Conserval Solarwall to the five designated buildings, the Engineer-In-Charge and the engineer responsible for conducting the evaluations attended a one day seminar on the Solarwall at the National Research Energy Laboratory in Denver. During the seminar, a laboratory test installation of the Solarwall was visited and conducted by Mr. John Hollick, President of Conserval Engineering, Inc.

The design manual and associated literature on the Solarwall were obtained from Conserval Engineering, Inc. for use in the evaluations. The five buildings at Fort Carson were then inspected for application of the Solarwall, and all data necessary for the evaluations were collected. Vertical temperature profiles were measured, along with the surface temperatures of exterior south-facing walls.

The existing ventilation heating loads were calculated using the heating degree day method. Solar insolation data for Fort Carson were taken from a 1981 publication by the Colorado Office of Energy Conservation, *Passive Solar Energy for Builders*. Construction cost estimates were provided by Conserval Engineering, Inc.

1.6.3 HVAC Controls Surveys

Buildings designated under ECO 31 in Table 1.1 on page 1.1 are to be included in a Utility Control System (UCS) project planned for construction at Fort Carson. Under the UCS project, existing pneumatic, electric and electronic controls are to replaced. Equipment not being replaced, but must be in good condition and operable include heating and cooling coil control valves, valve actuators, control dampers and damper actuators. The actuators will remain either pneumatic or electric, as currently configured.

All candidate equipment was inspected for condition. Most of the control valves and valve actuators have reached the end of their expected service life. Needed repairs and replacements were noted, cost estimates were made, and the results tabulated.

1.7 ECONOMIC ANALYSIS

Life Cycle Cost Analysis was accomplished in accordance with the National Institute of Standards and Technology Handbook 135 (NIST HNB 135) and the October 1992 ECIP guidance. There have been no changes to the NIST HNB 135 since the 1985 EEAP study except for annual updates of present worth factors to reflect changes in projected energy price escalation rates and discount rates. However, there have been significant changes to the ECIP guidance since 1985, including:

- The discount rate has been changed from 7 percent to 4 percent, which increases the present value of energy cost savings over the economic life of a system
- The prescribed economic life of the various equipment and system categories has also changed, generally being shortened, which reduces the number of years that energy cost savings accrue for credit in the Life Cycle Cost Analysis.
- The minimum project construction cost for an ECIP project has been increased from \$200,000 to \$300,000, which makes it more difficult to qualify low cost projects for ECIP funding.
- The Non-energy Savings Test has been deleted. Therefore, all non-energy savings are a credit to the Life Cycle Cost Analysis.

Other changes since 1985 that impact the study include:

- Inflation in construction costs.
- Electric energy and demand rates have increased about 35 percent since 1985, whereas
 natural gas prices have decreased about 26 percent as the result of a new gas purchase
 contract.

1.8 PERSONS RESPONSIBLE FOR THE WORK

All work on this contract was performed by E M C Engineers, Inc. personnel. Specific responsibilities are as follows:

Project Manager: Engineer-In-Charge: Building Surveys: Eric J. Young, P.E. Tom J. Forster, P.E., Ph.D

James O. Edwards, P.E.

Alan J. Niemeyer John A. Mekis, P.E.

Tom J. Forster, P.E., Ph.D

Alan J. Niemeyer Dennis E. Jones, P.E.

Tom J. Forster, P.E., Ph.D

Eric J. Young, P.E.

Report Writing
Quality Control:

Solarwall Analysis

ECO Analysis:

1.9 WORK ACCOMPLISHED TO DATE

All work required under the contract is included in this prefinal report.

1.10 PLAN FOR COMPLETING THE WORK

The results of the work as presented in this prefinal report will be presented at a formal presentation and review meeting, to be held after reviewer comments are received. Subsequently the report will be revised in accordance with the comments and direction received at the presentation and review meeting, and will be submitted in its final form.

SECTION 2.0

ENERGY CONSUMPTION AND PRICE DATA

2.1 HISTORICAL ENERGY CONSUMPTION

Monthly electrical and natural gas consumption and cost data are presented in Table 2-1 on page 2-2 for FY90, FY91 and FY92.

2.2 UNIT ENERGY PRICES

Electricity: The current unit kWh price is \$0.025, and the unit daily kW price is \$0.1909, which results in an annual kW charge of \$69.68.

Natural Gas: Gas prices have varied considerably since May 1992, but appeared to stabilize at approximately \$3.48/MBtu in late 1992, which is the price used for this study.

TABLE 2-1 HISTORICAL UTILITY CONSUMPTION AND COST DATA

FY90	kWh	kW	\$	kcf	\$
OCT	7,441,303	14,893	271,285	87,449	286,423
NOV	7,738,583	14,677	298,900	131,130	421,048
DEC	7,691,999	15,055	292,970	175,344	541,171
JAN	9,032,785	15,195	320,100	187,697	581,368
FEB	8,033,070	15,466	287,912	200,038	491,363
MAR	7,461,000	15,131	267,564	144,198	453,778
APR	8,406,000	15,001	301,382	115,536	410,169
MAY	7,011,000	14,029	250,481	77,953	255,678
JUN	7,110,000	14,159	262,564	37,920	153,084
JUL	7,299,000	14,850	271,713	48,618	181,749
AUG	7,254,000	14,774	264,531	28,931	122,555
SEP	6,993,000	14,828	225,613	40,846	153,724
FY91	kWh	kW	\$	kcf	\$
OCT NOV DEC JAN FEB MAR APR MAY JUN JUN JUL AUG SEP	8,280,000 6,597,000 7,974,000 9,369,000 8,181,000 7,362,000 7,893,000 7,002,000 7,575,000 7,389,000 7,317,000 8,271,000	13,932 14,126 14,872 15,066 14,861 14,591 14,396 14,440 14,018 14,699 14,915 15,412	289,552 234,076 279,244 338,243 291,778 259,099 276,175 245,398 272,091 284,539 269,637 307,316	97,888 129,531 191,574 192,940 139,713 142,271 106,914 57,255 32,544 34,222 35,719 46,306	225,957 325,849 490,023 445,495 296,185 295,330 235,825 146,609 103,002 102,250 104,067 123,831
FY92	kWh	kW	\$	kcf	\$
OCT	7,416,000	14,105	270,472	90,208	219,516
NOV	8,442,000	14,893	301,676	156,336	354,964
DEC	8,001,000	15,217	295,877	174,282	394,308
JAN	8,370,000	15,163	321,895	172,606	383,687
FEB	8,676,000	15,412	319,081	145,837	285,032
MAR	7,821,000	15,347	289,377	135,969	280,278
APR	7,731,000	14,461	284,130	88,129	198,173
MAY	7,002,000	14,288	257,937	47,612	127,431
JUN	8,460,000	14,990	318,307	39,934	119,766
JUL	7,245,000	14,904	270,779	33,682	108,103
AUG	8,244,000	15,509	311,193	33,794	115,047
SEP	6,732,000	15,142	256,262	41,871	136,326

SECTION 3.0

SOLAR WALL ANALYSIS

3.1 GENERAL:

Conserval Engineering, Inc. of Canada offers a solar air collector in the form of an exterior wall that preheats ventilation air. The trade name of the collector is Conserval Solarwall, usually referred to as Solarwall. Solarwall comes in three configurations: a glazed wall; a perforated metal wall (High Performance Solarwall); and a perforated metal wall that ties into a canopy (Canopy Solarwall).

This section presents evaluations of the application of Solarwall to five buildings at Fort Carson. In each case the existing conditions were determined by inspection of the building construction, mechanical systems, hours of operation, and measurement of the space vertical air temperature profile. A concept for applying one of the Solarwall configurations was developed that would integrate the retrofit system into the building without adversely impacting the current mission. The concept was then evaluated by calculating the avoided utility energy consumed as the result of the energy gained through the Solarwall, and the energy saved by reducing wall heat losses and exhaust air heat losses.

All five buildings were inspected by EMC engineers on a sunny afternoon, the 27th of January, 1993. The outdoor temperature was in the low fifties, the sun was shining, and the wind was very light. Building managers were interviewed at the two gymnasiums.

Appendix B contains product literature and calculations for this section.

3.2 BUILDING P-1160: GYMNASIUM

<u>Existing Conditions</u>: The building is open for use 94 hours per week. Use of the basketball gymnasium varies from just a few individuals during the day to group usage and team play after the daily work shift. The need for ventilation in the main gym is not great during the work day.

Wall construction is 4 inch brick on rigid insulating board on 8 inch concrete masonry block. The east, south and west walls of the gym are effective passive solar walls. South and west exterior wall surface temperatures were measured at 100°F. Roof construction is a 3-ply built-up roof on 3 inches of rigid insulation on a steel deck.

Two unit ventilators mounted on the east wall and two mounted on the west wall provide 6,000 cfm of heated makeup air when the building is in operation and the outside temperature is 40°F or below. Exhaust fans are interlocked to the unit ventilators to insure air balance. Four destratification fans run during building operating hours, and are effective in reducing temperature stratification. The building manager has manual control of the unit ventilators and the exhaust fans, should he desire to operate them.

The hot water coils are supplied with medium temperature water supplied by the central heating plant via a heat exchanger.

The building temperature is well controlled. Air temperature at five feet above the floor was measured at 65°F and ceiling air temperature was measured at 68°F. Air temperature stratification is not a problem in this building.

The makeup air heating load on this building is not large. The use of time clocks and the careful attention of the building manager are effective in maintaining good comfort conditions and reducing the run time of the mechanical system. Seldom are there many persons on the gym floor at once, so the need for ventilation is minimal. Also, the brick walls absorb solar heat which eliminates heat loss during most of the daylight hours and well into the evening. Roof surface temperature was not measured, but is very likely above ambient air temperatures when the sun is shining on it. With an R-11 roof and little temperature stratification, roof heat loss is not excessive.

<u>Proposed Retrofit Concept</u>: A High Performance Solarwall is to be installed on the west wall, and ducted so as to connect to the existing outside air intake ducts on the two unit ventilators mounted on the west wall. The installation would require modification of the existing intakes on the unit ventilators. Solarwall would function as a preheater for the existing makeup air system. The Solarwall analysis and backup data are presented in Appendix B.

Results of Analysis:

Inputs:	Ventilation rate	6,000	cfm
_	Solar wall area	1,111	sqft
	Collector efficiency	65	%
	System unit cost	\$17.88	/sqft
	Unit energy price		/Mbtu
	Purchased hot water efficiency	<i>7</i> 0	%
	Economic life	10	yrs
Outputs:	System first cost	\$19,867	
_	Annual energy savings	107.6	Mbtu
	Annual energy cost savings	\$535	
	Simple payback	37.1	yrs
	Energy discount factor	9.51	•
	Discounted energy cost savings	\$5,089	
	SIR	0.3	
	Internal rate of return	-9.24	%

Conclusions and Recommendations: The existing conditions at this building seriously limit the performance of Solarwall. The lack of significant temperature stratification, the high exterior wall surface temperatures, and the very low number of annual operating hours of the ventilation system limit the potential contribution of solar energy and makes a Solarwall retrofit cost prohibitive. A Solarwall retrofit for this building is not recommended. This particular building is already very energy efficient, well maintained, and properly operated.

3.3 BUILDING P-2357: GYMNASIUM

<u>Existing Conditions</u>: This gymnasium is similar in operation to Building 1160. It operates 94 hours per week with low daytime usage of the basketball gym during the work day.

The building is also of brick and concrete masonry block construction, and the southeast and southwest walls are effective passive solar collectors. Exterior southeast and southwest wall surface temperatures were measured at 96°F.

Four unit ventilators and two exhaust fans serve the basketball gym. They run continuously and have a winter and a summer mode. The outside air dampers on all four units are in the minimum position for winter operation, which is approximately the 25% flow rate position. The winter ventilation rate is 2,825 cfm, which is very low, but adequate for this facility. Exhaust air is balanced to maintain building pressure. There are no destratification fans. The supply air distribution ductwork is very adequate for the basketball gym.

A time clock is installed to control the makeup air and exhaust system, but the pins are removed. Also, the system controls are not accessible to the building manager. As a result, the hot water heating coils operate continuously in the winter months and the gym is overheated. Air temperatures at the floor level were measured at 86°F. Ceiling temperatures were measured at 93°F. Entry doors are frequently opened to increase infiltration in order to cool the gymnasium.

Hot water is provided by the central heating plant via a heat exchanger.

<u>Proposed Retrofit</u>: A Canopy Solarwall is to be installed on the southwest wall, connecting into the two existing makeup air ducts that serve two unit ventilators. It is assumed that before the Canopy Solarwall is installed, the controls on the four unit ventilators would be repaired, the time clock operation would be restored, and an outside temperature lockout control would be installed on the unit ventilators to shut them off at ambient temperatures below 50°F. These repair actions would bring the building conditioning under control, which it should be before a solar system is added.

Results of Analysis:

Inputs:	Ventilation rate	2,825	cfm
	Solar wall area	523	sq ft
	Collector efficiency	65	-
	System unit cost	\$17.88	/sqft
	Unit energy price		/Mbtu
	Purchased hot water efficiency	70	%
	Economic life	10	yrs
Outputs:	System first cost	\$9,354	
	Annual energy savings	126	Mbtu
	Annual energy cost savings	\$626	
	Energy discount factor	9.51	
	Discounted energy cost savings	\$5,952	/yr
	Simple payback	14.9	-

SIR
Internal rate of return

0.6 -0.60 %

<u>Conclusions and Recommendations</u>: The efficiency of the existing wall construction acting as a passive solar wall, coupled with the low ventilation rate and low number of ventilation hours result in a long payback for Solarwall. It is not recommended for this building.

<u>Comment</u>: The existing controls on the unit ventilators should be repaired, the time clocks operation should be restored, and the clock and system controls should be made accessible to the building manager.

3.4 BUILDING P-8030: T.O.E. MAINTENANCE FACILITY

Existing Conditions: This industrial building operates 168 hours per week.

The lower wall construction is concrete masonry block. The upper wall construction is corrugated metal sheet on steel frame with an insulating liner. The metal wall is painted dark grey. South exterior metal wall surface temperatures measured 78°F late on a sunny afternoon. Roof construction is 3-ply built-up roofing on rigid insulation on steel deck. The large overhead doors are not insulated, but fit well.

The building is served by unit ventilators equipped with supply and exhaust fans, hot water coils and heat recovery wheels. The units run 24 hours per day and use 100% outside air. The heat recovery wheels transfer heat from the exhaust stream to the make up air stream when they are operational. The air system exhausts air from both ceiling and floor areas through the heat recovery wheels. The building is equipped with extensive supply and exhaust air ductwork. Air distribution is excellent.

Hot water is provided by the central heating plant via heat exchangers.

At the time of the building inspection, many of the overhead doors were open, which is frequently the case, especially when the wind velocity is low and the sun is shining. Ceiling and floor level air temperatures were measured at 64°F in the vicinity of the doors.

The operation of the ventilation system without the heat recovery wheels results in excessive hot water usage to heat the large volume of fresh air that is taken into the building. It is assumed that the heat recovery wheels would be repaired before the Solarwall is constructed.

<u>Proposed Retrofit</u>: A Canopy Solarwall is to be mounted on the upper south wall above the overhead doors on the three south sections of the building. The Solarwall would be ducted into the make up air intakes on the three unit ventilators.

The northwest and northeast sections of the building are not good candidates for Solarwall because of the location of the mechanical equipment rooms with respect to the south walls of these building sections. The make up air intakes for these building sections are on the north walls.

Results of Analysis:

Inputs:	Ventilation rate	153,000	cfm
_	Solar wall area	14,160	sq ft
	Collector efficiency	65	-
	System unit cost	\$17.88	/sq ft
	Unit energy price		/MBtu
	Purchased hot water efficiency	70	%
	Economic life	10	yrs
Outputs:	System first cost	\$253,181	
	Annual energy savings	957	MBtu
	Annual energy cost savings	\$4,727	
	Simple payback	54	yrs
	Energy discount factor	9.51	•
	Discounted energy cost savings	\$44,955	
	SIR	0.2	
•	Internal rate of return	-12.51	%

Conclusions and Recommendations: The heat recovery wheels and the Solarwall are not compatible, in that the installation of the Solarwall seriously degrades the effectiveness of the heat recovery wheels. The combined result is a very small decrease in hot water coil load, and does not justify the installation of a Solarwall. In fact, the heat recovery wheel and Solarwall have similar performance characteristics. Both act as preheaters for the make up air. Both have performance efficiency of about 70%. However, the heat wheel is even more effective at night than it is in the daytime, because of the lower night ambient temperatures. The heat wheel also reduces the losses of exhausting stratified hot air in the building by recovering much of the heat from the exhaust air stream.

The current annual gas cost of operating the 3 unit ventilators in the south bays with the heat recovery wheels inoperative is \$92,904. Repair of the heat recovery wheels would reduce the cost for gas to \$28,138, for an annual savings of \$64,766. Adding Solarwall would further reduce the annual gas cost to \$23,410 for an additional annual savings of only \$4,727 per year.

Installation of Solarwall on P-8030 is not recommended.

<u>Comment</u>: The annual gas cost to operate the ventilation system in the entire building without Solarwall and with the heat recovery wheels inoperative is \$173,408 at the current price of gas. This is the current situation. If the heat recovery wheels were repaired on all seven unit ventilators, the annual gas cost would drop to \$57,300, which would produce an annual savings of \$116,109. The cost of the repairs would be approximately \$14,000.

3.5 BUILDING P-8142: VEHICLE MAINTENANCE FACILITY

Existing Conditions: This industrial building used for vehicle maintenance operates from 0700 to 1600 hrs on weekdays.

The building is similar in wall and roof construction to Building P-8030. Exterior metal walls are painted light grey, and surface temperatures on the south exterior walls measured 98°F. At the time of the survey, most of the overhead doors were open and all heating was off. Floor slab temperatures were measured at 61°F, and ceiling temperatures were also measured at 61°F.

There are two bays: a west bay (north-south axis), and an east bay (east-west axis). Both are served by unit ventilators with hot water coils with make up air intakes located on the roof. Several hot water fan coil units provide space heat. These units are controlled by thermostats set for 65°F, but have on-off switches which are shut off when the overhead doors are open. A manually controlled vehicle exhaust air system is operated when needed. It exhausts air from the floor level. The existing supply air distribution system is excellent.

Proposed Retrofit:

The two high bay areas were inspected for application of Solarwall. It is proposed to construct a Canopy Solarwall on the south wall of each of the two bays, to provide preheated air for the unit ventilators.

Results of Analysis:

Inputs:	Ventilation rate	9,120	cfm
-	Solar wall area	1,689	
	Collector efficiency	65	-
	System unit cost	\$17.88	/sq ft
	Unit energy price		/MBtu
	Purchased hot water efficiency	70	%
	Economic life	10	yrs
Outputs:	System first cost	\$30,197	
	Annual energy savings	231	MBtu
	Annual energy cost	\$1,146	
	Simple payback	26.3	yrs
	Energy discount factor	9.51	
	Discounted energy cost savings	\$10,900	
	SIR	0.4	
	Internal rate of return	-6.08	%

Conclusions and Recommendations: The low operating hours of the unit ventilators is the main reason Solarwall is not cost effective for this building. The absence of strong temperature stratification also reduces the effectiveness of Solarwall. It is not recommended for implementation on Building P-8142.

3.6 BUILDING P-8300: D/S MAINTENANCE FACILITY

<u>Existing Conditions</u>: This industrial vehicle maintenance building operates from 0700 to 1600 hrs on weekdays.

Wall and roof construction are similar to the construction of Building P-8030, except that the exterior walls are painted blue. The exterior south metal wall surface temperature was measured at 78°F.

At the time of the building inspection, the overhead doors were open and all air systems were off. The maintenance bay floor slab temperature was measured at 63°F, and the ceiling air temperature was measured at 70°F.

The building has a west bay and an east bay that were inspected for application of Solarwall. Each bay is served by a single heat and vent unit equipped with a medium temperature hot water coil. The make up air intake is on the roof. The existing supply and exhaust air ducting is quite extensive and is very adequate. Hot water fan coil units provide space heat when the overhead doors are not open. They are controlled by wall-mounted thermostats set for 65°F.

<u>Proposed Retrofit</u>: A Canopy Solarwall is proposed for the east bay, where connection to the heat and vent unit make up air intake is easily made. Installation on the west bay would require an insulated air duct to run 150 feet on the roof to reach the make up air intake of the heat and vent unit.

Results of Analysis:

Inputs:	Ventilation rate	26,420	ctm
	Solar wall area	2,172	sq ft
	Collector efficiency	65	%
	System unit cost	\$17.88	/sq ft
	Unit energy price	\$3.48	/MBtu
	Purchased hot water efficiency	70	%
	Economic life	10	yrs
Outputs:	System first cost	\$38,835	
_	Annual energy savings	325	MBtu
	Annual energy cost savings	\$1,617	
	Simple payback	24.0	yrs
	Energy discount factor	9.51	•
	Discounted energy cost savings	\$15,377	
	SIR	0.4	
	Internal rate of return	-5.20	%

<u>Conclusions and Recommendations</u>: Solarwall is not cost effective for this building and is not recommended. Again, the operating hours are insufficient, and the absence of large stratification heat savings negatively impacts the performance of Solarwall.

SECTION 4.0

UPDATE OF ECO ANALYSES

4.1 ECO 13: MOTOR REPLACEMENT

This ECO applies to 38 buildings, and includes 141 motors. Motor operational status was determined by inspection. Each motor was inspected for general condition, nameplate data was taken, and the motor operating schedule was obtained from the building manager. This information was checked against the same data acquired in the 1985 study by Forster-Morrell Engineering Assoc., Inc. For many buildings the data was the same. A few motors have been replaced in the interim period. Motors which have not been replaced in the interim period are assumed to have a remaining economic life of five years.

Motor efficiency was estimated for each motor surveyed, and the annual kWh consumption and kW demand were calculated. Then the same calculations were made for high efficiency motors of the same size. Efficiencies for the replacement motors were taken as the average of high efficiency motor efficiencies from three motor manufacturers. Energy savings and reduction in demand were then calculated for each replacement motor. High efficiency motor purchase and installation costs were based on vendor prices and Means Mechanical Cost Data 1993.

The results of the analysis are presented in Tables 4-1 and 4-2. LCCA summary sheets, calculations, and backup data are included in Appendix C, Tab 1.

TABLE 4-1 ECO 13: ENERGY SAVINGS SUMMARY

Motor Size (HP)	Number of Motors	Electric Energy Savings (kWh)	Reduced Electrical Demand (kW)
1/2 3/4 1 1-1/2 2 3 5 7-1/2 10 15 20 25 30 40	12 17 8 13 10 10 29 13 13 2 2 4 2	7,199 5,925 3,282 7,482 8,786 12,718 63,182 31,151 29,201 7,846 5,054 18,030 9,384 38,207	1.35 1.26 0.65 1.50 1.31 2.05 8.77 4.87 5.26 1.19 1.22 2.74 1.43 5.82
Total	141	247,447	39.42

TABLE 4-2 ECO 13: ECONOMIC SUMMARY

Motor Size (HP)	No. of Motors	Elec. Energy (\$/yr)	Elec. Demand (\$/yr)	Invest. Cost (\$)	Simple Payback (yrs)	SIR	AIRR %
1/2 3/4 1 1-1/2 2 3 5 7-1/2 10 15 20 25 30 40	12 17 8 13 10 10 29 13 13 2 2 4 2 6	180 148 82 187 220 318 1,580 789 730 196 126 451 235 955	94 88 45 105 91 143 611 339 367 83 85 191 100 406	3,089 4,616 3,549 5,952 4,767 4,966 15,141 9,083 10,122 2,184 2,642 6,783 3,989 15,536	7.8 11.1 14.2 12.0 10.0 7.4 5.4 6.1 6.8 6.1 8.5 7.7 8.4 8.1	1.91 1.37 1.08 1.26 1.50 2.00 2.74 2.43 2.17 2.43 1.75 1.93 1.77 1.83	7.41 5.65 4.39 5.19 6.14 7.67 9.38 8.71 8.11 8.72 6.95 7.48 7.02 7.20
All Motors	141	6,196	2,747	92,418	7.4	2.00	7.66

Conclusions and Recommendations: Replacement of standard motors with high efficiency motors is cost effective for motor sizes of 1/2 HP or greater, providing the annual operating hours exceed approximately 4000. Simple payback varies from 5.4 to 14.2 years, depending on motor size and hours of use.

For the entire group of 141 motors, the investment cost of \$92,418 has a simple payback of 7.4 years with an SIR of 2.0.

It is recommended that the motors included in this study be replaced with high efficiency motors as soon as funds are available. Certainly it is clear from the results of this study that a policy of replacing standard motors with high efficiency motors should be implemented at Fort Carson. This will reduce the electrical demand, save energy, increase motor service life, and lower maintenance costs over the life of the motors.

4.2 ECO 14: NIGHT SETBACK THERMOSTATS

Eight buildings were analyzed for this ECO. The building conditions and systems are the same today as they were in 1985 for buildings P-1007, P-1955 and P-2700. New conditions exist at buildings P-1956, P-2055, P-2056, P-2155 and P-2156, which are all similar to P-1955. Computer simulations were performed for the primary building, P-1955.

Results of the evaluations are shown in Table 4-3. LCCA summary sheets and backup data are included in Appendix C, Tab 2.

TABLE 4-3 ECO 14: SUMMARY OF RESULTS

Bldg. No.	Electric Energy Savings (MBtu/yr)	Gas Energy Savings (MBtu/yr)	Investmt Cost (\$)	Electric Cost Savings (\$/yr)	Gas Cost Savings (\$/yr)	SPB (yrs)	SIR	AIRR %
P-1007	22.0	331	1,120	377	1,151	0.7	18.5	26.3
P-1955	0	160	373	0	557	0.7	21.1	27.5
P-1956	0	160	373	- 0	557	0.7	21.1	27.5
P-2055	0	65	373	0	228	1.6	8.6	20.1
P-2056	0	160	373	0	557	0. <i>7</i>	21.1	27.5
P-2155	0	160	373	0	557	0.7	21.1	27.5
P-2156	0	160	373	0	557	0. <i>7</i>	21.1	27.5
P-2700	0	1,435	2,614	0	4,988	0.5	27.0	29.6
ALL								
BLDGS	22.0	2,631	5,974	377	9,150	0.6	22.4	28.0

<u>Conclusions and Recommendations</u>: Each of the 8 buildings qualify for implementation of ECO 14 with an SIR >1.25. The economic benefit is very large for the small investment cost with SPB ranging from 0.5 to 1.6 years, and SIR ranging from 27.09 to 8.6. It is recommended that ECO 14 be implemented as soon as funding permits, with a high priority.

4.3 ECO 16: DRY BULB AIR ECONOMIZERS

Buildings P-1850 and P-2359 were reanalyzed for this ECO. Both buildings are chapels. The schedules of religious services and the thermostat schedules have changed since 1985. Both buildings were analyzed in 1985.

P-2359 is served by two air handlers, one of which already has an economizer. AHU-2 serves the administrative area and is not equipped with an economizer. It was analyzed for ECO 16.

P-1850 is served by a single air handler which is not equipped with an economizer. It was analyzed for ECO 16.

In both BCEP simulations the minimum outside air settings were taken from the current ASHRAE standard for ventilation requirements. The results are presented in Table 4-4. LCCA summary sheets and backup data are included in Appendix C, Tab 3.

TABLE 4-4
ECO 16: SUMMARY OF RESULTS

Bldg. No.	Electric Energy Savings (MBtu/yr)	Gas Energy Savings (MBtu/yr)	Investmt Cost (\$)	Electric Cost Savings (\$/yr)	Gas Cost Savings (\$/yr)	SPB (yrs)	SIR	AIRR %
P-1850 P-2359 ALL BLDGS	0 0 0	223.1 84.7 307.8	5,776 2,921 8,697	0 0 0	775 294 1,070	7.4 9.9 8.1	2.5 1.9 2.3	8.9 7.3 8.4

<u>Conclusions and Recommendations</u>: ECO 16 is medium cost effective for both buildings and should be implemented as soon as funding permits.

4.4 ECO 19: AUTOMATIC RADIATOR CONTROLS

Twenty buildings are listed in the SOW to be reevaluated for this ECO. It was determined at the time of the field inspections that Building P-6233 is scheduled to be demolished, and that steam radiators in buildings P-6234 and P-6253 have been removed and air systems have been installed. Consequently, only 17 buildings were included in the reevaluation of ECO 19.

The proposed retrofit is to install a control valve on each radiator, connected to a wall mounted thermostat by a capillary tube. No electrical power is required.

Since 1985, each of the buildings has been modified with double pane windows, and all of the buildings are being converted from medical clinics to administrative type uses. Both the building use schedules and construction have changed, so new energy savings calculations were made. The two primary buildings, P-6220 and P-6230 were rerun on the BCEP. The results of analysis are presented in Tables 4-5. LCCA summary sheets and backup data are included in Appendix C, Tab 4.

TABLE 4-5 ECO 19: SUMMARY OF RESULTS

Bldg. No.	Electric Energy Savings (MBtu/yr)	Gas Energy Savings (MBtu/yr)	Investmt Cost (\$)	Electric Cost Savings (\$/yr)	Gas Cost Savings (\$/yr)	SPB (yrs)	SIR	AIRR %
S-6220	0	412	7,526	0	1,433	5.3	2.7	11.1
S-6221	0	193	4,487	0	672	6.7	2.1	9.4
S-6222	0	641	14,184	0	2,229	6.4	2.2	9.7
S-6223	0	319	10,566	0	1,110	9.5	1.5	6.8
S-6224	0	819	25,039	0	2,846	8.8	1.6	7.4
S-6236	0	667	21,710	0	2,317	9.4	1.5	6.9
S-6237	0	746	21,710	0	2,592	8.4	1.7	7.7
S-6243	0	850	14,908	0	2 <i>,</i> 955	5.0	2.8	11.4
S-6230	0	591	17,079	0	2,056	8.3	1.7	7.8
S-6231	0	554	14,908	0	1,924	7.7	1.8	8.3
S-6235	0	554	14,908	0	1,924	7.7	1.8	8.3
S-6240	0	551	17,224	0	1,914	9.0	1.6	7.2
S-6241	0	554	14,908	0	1,924	7.7	1.8	8.3
S-6244	0	590	11,579	0	2,052	5.6	2.5	10.6
S-6252	0	590	15,921	0	2,049	<i>7</i> .8	1.8	8.3
S-6254	0	554	14,908	0	1,924	7.7	1.8	8.3
S-6255	0	691	22,434	0	2,404	9.3	1.5	6.9
ALL								
BLDGS	0	9,875	263,997	0	34,325	7.7	1.8	8.3

Conclusions and Recommendations: ECO 19 is medium cost effective, with SPB ranging from a low of 5.0 years to a high of 9.5 years. However, each of the 17 buildings qualify with an SIR >1.25. Taken as a single project for all 17 buildings, the investment cost is \$263,997 with an SPB of 7.7, SIR of 1.8 and an AIRR of 8.3%. It is recommended that ECO 19 be implemented as a single project when funds are available.

4.5 RECOMMENDATIONS WITH REGARD TO ECIP PROJECTS

Table 4-6 on the following page presents the results for all of the buildings in each ECO, and for the four ECOs grouped into a single project. The LCCA for the group of all ECOs is in Appendix C, Tab 5.

TABLE 4-6
PRIORITIZED ECO SUMMARY

ECO No.	Electric Energy Savings (MBtu/yr)	Gas Energy Savings (MBtu/yr)	Investmt Cost (\$)	Electric Cost Savings (\$/yr)	Gas Cost Savings (\$/yr)	SPB (yrs)	SIR	AIRR %
14 16	22 0	2,631 308	5,9 74 8,697	3 77 0	9,145 1,070	0.6 8.1	22.4 2.3	28.0 8.4
13	846	0	92,418	8,944	0	7.4	2.0	7.7
19 ALL	0	9,875	263,997	0	34,325	7.7	1.8	8.3
ECOs	868	12,814	371,086	9,104	53,645	6.5	2.7	9.4

The total investment cost of all qualifying ECOs is \$367,106, which exceeds the \$300,000 ECIP project threshold limit. Therefore, it is possible to submit the 4 qualifying ECOs as an ECIP project without combining them with other energy projects at Fort Carson. However, the total project SPB of 6.5 years is marginally competitive. It is recommended that cost effective energy conservation projects already identified in other projects, such as for Evans Army Hospital, be combined with those from this study into a single ECIP project to reduce the SPB. This would improve the probability of obtaining ECIP funding. For such an ECIP project it would be necessary to reevaluate the economic effectiveness of the Evans Hospital ECOs using the current ECIP guidance. Program documentation would have to be prepared for the ECIP project.

SECTION 5.0

HEATING AND COOLING EQUIPMENT DISCREPANCIES

5.1 GENERAL

Buildings designated for inspection of the condition of the heating and cooling equipment and controls are listed in Table 1-1 on page 1-3. These buildings are scheduled for installation of a Utility Control System (UCS), which will result in the replacement of conventional pneumatic and electric temperature controls with Direct Digital Controls (DDC). The existing pneumatic or electric actuated coil control valves and modulating air dampers will remain as presently configured. All other temperature control elements will be replaced.

The inspections were limited to determining the general condition of the heating and cooling equipment, control valves and actuators, and dampers and damper actuators, the purpose being to identify the repairs necessary to make the equipment fully functional when the DDC systems are installed. The performance of a DDC system is only as good as the performance of the dampers and valves in the system.

5.2 INSPECTION PROCEDURES

The barracks buildings are served by fan coil units which receive hot and chilled water from the central heating and cooling plant. The emphasis of the inspections in these buildings was in the mechanical rooms, where heat exchangers and control valves are located for the building heating water and chilled water loops. Condition of piping insulation, valves and valve actuators, outside temperature reset controls, pumps, motors and flange gaskets was determined.

In the other buildings, air handlers serve the various spaces. Each AHU was inspected visually for general condition to include the operational status of dampers and coil control valves, the condition of damper and valve actuators, fan belt tension (noticeable slippage), and filter condition. Fan motor nameplate data were also recorded.

All data were recorded as corrections on the 1985 field survey forms, and changes in condition were noted. The survey forms are located in Appendix D.

It was determined that most of the control valves are original, and near the end of their service lives. Some valves are leaking, and some are badly corroded. Others appeared to be in good condition. However, valves that are near the limit of the specified service life (usually 15 years), are apt to have hysteresis, which will defeat the precise control of flow rates that DDC can provide. Therefore, it is recommended that all control valves be replaced regardless of the apparent condition.

5.3 REPAIR COST ESTIMATES

Control discrepancies for each equipment item were identified and are indicated on the survey data sheets in Appendix D. Unit labor and material cost estimates were made for the repair of each discrepancy, and from these the cost of repair for units in each building was estimated. The principal source for material and labor prices is the Means Mechanical Cost Data 1993. Labor rates are adjusted to the Colorado Springs area. Cost estimates are included in Appendix D.

The total estimated cost for repairing the inspected equipment is \$320,236, which includes 20% contingency.

APPENDIX A

SCOPE OF WORK CONFIRMATION NOTICES

May 1992 Revised August 19, 1992 (1) January 20, 1993 (2)

GENERAL SCOPE OF WORK

FOR

UPDATING an EXISTING

ENERGY STUDY

Performed as part of the ENERGY ENGINEERING ANALYSIS PROGRAM (EEAP)

SCOPE OF WORK FOR UPDATING AN EXISTING ENERGY STUDY

TABLE OF CONTENTS

- BRIEF DESCRIPTION OF WORK
- 2. **GENERAL**
- PROJECT MANAGEMENT 3.
- SERVICES AND MATERIALS 4.
- PROJECT DOCUMENTATION 5.
 - 5.1 ECIP Projects
 - 5.2 Non-ECIP Projects
 - 5.3 Nonfeasible ECOs
- DETAILED SCOPE OF WORK 6.
- WORK TO BE ACCOMPLISHED 7.
 - 7.1 Review Previous Studies
 - 7.2 Perform a Limited Site Survey
 - 7.3 Reevaluate Selected Projects7.4 Evaluate Selected ECOs

 - 7.5 Combine ECOs into Recommended Projects
 - 7.6 Submittals, Presentations and Reviews

ANNEXES

- A DETAILED SCOPE OF WORK
- B EXECUTIVE SUMMARY GUIDELINE
- C REQUIRED DD FORM 1391 DATA

- 1. BRIEF DESCRIPTION OF WORK: The Architect-Engineer (AE) shall:
- 1.1 Review the previously completed Energy Engineering Analysis Program (EEAP) study which applies to the specific buildings, systems, or energy conservation opportunities (ECO) covered by this study.
- 1.2 Perform a limited site survey of specific buildings or areas to collect all data required to evaluate the specific ECOs included in this study.
- 1.3 Reevaluate the specific projects or ECOs from the previous study to determine its economic feasibility based on revised criteria, current site conditions and technical applicability.
- 1.4 Evaluate specific ECOs to determine their energy savings potential and economic feasibility.
- 1.5 Provide project documentation for recommended ECOs as detailed herein.
- 1.6 Prepare a comprehensive report to document all work performed, the results and all recommendations.

2. GENERAL

- 2.1 This study is limited to the evaluation of the specific buildings, systems, or ECOs listed in Annex A, DETAILED SCOPE OF WORK.
- 2.2 The information and analysis outlined herein are considered to be minimum requirements for adequate performance of this study.
- 2.3 The "Energy Conservation Investment Program (ECIP) Guidance", described in letter from CEHSC-FU, dated 28 June 1991 and the latest revision from CEHSC-FU establishes criteria for ECIP projects and shall be used for performing the economic analyses of all ECOs and projects. The program, Life Cycle Cost In Design (LCCID), has been developed for performing life cycle cost calculations in accordance with ECIP guidelines and is referenced in the ECIP Guidance. If any program other than LCCID is proposed for life cycle cost analysis, it must use the mode of calculation specified in the ECIP Guidance. The output must be in the format of the ECIP LCCA summary sheet, and it must be submitted for approval to the Contracting Officer.
- 2.4 Energy conservation opportunities determined to be technically and economically feasible shall be developed into projects acceptable to installation personnel. This may involve combining

similar ECOs into larger packages which will qualify for ECIP, MCA, or PCIP funding, and determining in coordination with installation personnel the appropriate packaging and implementation approach for all feasible ECOs.

- 2.4.1 Projects which qualify for ECIP funding shall be identified, separately listed, and prioritized by the Savings to Investment Ratio (SIR).
- 2.4.2 All feasible non-ECIP projects shall be ranked in order of highest to lowest SIR.
- 2.4.3 At some installations Energy Conservation and Management (ECAM) funding will be used instead of ECIP funding. The criteria for each program is the same. The Director of Engineering and Housing will indicate which program is used at this installation. This Scope of Work mentions only ECIP, however, ECAM is also meant.

3. PROJECT MANAGEMENT

- 3.1 <u>Project Managers</u>. The AE shall designate a project manager to serve as a point of contact and liaison for work required under this contract. Upon award of this contract, the individual shall be immediately designated in writing. The AE's designated project manager shall be approved by the Contracting Officer prior to commencement of work. This designated individual shall be responsible for coordination of work required under this contract. The Contracting Officer will designate a project manager to serve as the Government's point of contact and liaison for all work required under this contract. This individual will be the Government's representative.
- 3.2 <u>Installation Assistance</u>. The Commanding Officer or authorized representative at the installation will designate an individual to assist the AE in obtaining information and establishing contacts necessary to accomplish the work required under this contract. This individual will be the installation representative.
- 3.3 <u>Public Disclosures</u>. The AE shall make no public announcements or disclosures relative to information contained or developed in this contract, except as authorized by the Contracting Officer.
- 3.4 Meetings. Meetings will be scheduled whenever requested by the AE or the Contracting Officer for the resolution of questions or problems encountered in the performance of the work. The AE's project manager and the Government's representative shall be required to attend and participate in all meetings pertinent to the work required under this contract as directed by the Contracting Officer. These meetings, if necessary, are in addition to the presentation and review conferences.
- 3.5 <u>Site Visits, Inspections, and Investigations</u>. The AE shall visit and inspect/investigate the site of the project as

necessary and required during the preparation and accomplishment of the work.

3.6 Records

- 3.6.1 The AE shall provide a record of all significant conferences, meetings, discussions, verbal directions, telephone conversations, etc., with Government representative(s) relative to this contract in which the AE and/or designated representative(s) thereof participated. These records shall be dated and shall identify the contract number, and modification number if applicable, participating personnel, subject discussed and conclusions reached. The AE shall forward to the Contracting Officer within ten calendar days, a reproducible copy of the records.
- 3.6.2 The AE shall provide a record of requests for and/or receipt of Government-furnished material, data, documents, information, etc., which if not furnished in a timely manner, would significantly impair the normal progression of the work under this contract. The records shall be dated and shall identify the contract number and modification number, if applicable. The AE shall forward to the Contracting Officer within ten calendar days, a reproducible copy of the record of request or receipt of material.
- 3.7 <u>Interviews</u>. The AE and the Government's representative shall conduct entry and exit interviews with the Director of Engineering and Housing before starting work at the installation and after completion of the field work. The Government's representative shall schedule the interviews at least one week in advance.
- 3.7.1 Entry. The entry interview shall describe the intended procedures for the survey and shall be conducted prior to commencing work at the facility. As a minimum, the interview shall cover the following points:
 - a. Schedules.
 - b. Names of energy analysts who will be conducting the site survey.
 - c. Proposed working hours.
 - d. Support requirements from the Director of Engineering and Housing.
- 3.7.2 Exit. The exit interview shall briefly describe the items surveyed and probable areas of energy conservation. The interview shall also solicit input and advice from the Director of Engineering and Housing.
- 4. <u>SERVICES AND MATERIALS</u>. All services, materials (except those specifically enumerated to be furnished by the Government), plant, labor, supervision and travel necessary to perform the work and render the data required under this contract are included in the lump sum price of the contract.

- 5. PROJECT DOCUMENTATION. All energy conservation opportunities which the AE has considered shall be included in one of the following categories and presented in the report as such:
- 5.1 ECIP Projects. To qualify as an ECIP project, an ECO, or several ECOs which have been combined, must have a construction cost estimate greater than \$300,000, a Savings to Investment Ratio greater than one and a simple payback period of less than eight years. For ECAM projects, the \$300,000 limitation may not apply; in such cases, the AE shall check with the installation for guidance. The overall project and each discrete part of the project shall have an SIR greater than one. All projects meeting the above criteria shall be arranged as specified in paragraph 2.7.1 and shall be provided with programming documentation. Programming documentation shall consist of a DD Form 1391, life cycle cost analysis (LCCA) summary sheet(s) (with necessary backup data to verify the numbers presented), and a Project Development Brochure (PDB). A life cycle cost analysis summary sheet shall be developed for each ECO and for the overall project when more than one ECO are combined. The energy savings for projects consisting of multiple ECOs must take into account the synergistic effects of the individual ECOs. [For projects and ECOs reevaluated from previous studies, the backup data shall consist of copies of the original calculations and analysis, with new pages revising the original calculations and analysis. In addition, the backup data shall include as much of the following as is available: the increment of work under which the project or ECO was developed in the previous study, title(s) of the project(s), the energy to cost (E/C) ratio, the benefit to cost (B/C) ratio, the current working estimate (CWE), and the payback period. The purpose of this information is to provide a means to prevent duplication of projects in any future reports.]
- 5.2 Non-ECIP Projects. Projects which do not meet ECIP criteria with regard to cost estimate, payback period, or non-energy (75%) qualification test, but which have an SIR greater than one shall be documented. Projects or ECOs in this category shall be arranged as specified in paragraph 2.7.2 and shall be provided with the following documentation: the life cycle cost analysis (LCCA) summary sheet completely filled out, a description of the work to be accomplished, backup data for the LCCA, ie, energy savings calculations and cost estimate(s), and the simple payback period. The energy savings for projects consisting of multiple ECOs must take into account the synergistic effects of the individual ECOs. In addition these projects shall have the necessary documentation prepared, as required by the Government's representative, for one of the following categories:
- a. Quick Return on Investment Program (QRIP). This program is for projects which have a total cost greater than \$3,000 but less than \$100,000 and a simple payback period of two years or less.
 - b. Productivity Enhancing Capital Investment Program (PECIP).

This program is for projects which have a total cost of greater than \$3,000 but lees than \$100,000 and a simple payback period of four years or less.

c. OSD Productivity Investment Funding (OSD PIF). This program is for projects which have a total cost of more than \$100,000 and a simple payback period of four years or less.

The above programs and the required documentation forms are all described in detail in AR 5-4, Change No. 1.

- d. Regular Military Construction Army (MCA) Program. This program is for projects which have a total cost greater than \$300,000 and a simple payback period of four to twenty-five years. Documentation shall consist of DD Form 1391 and a Project Development Brochure.
- e. Low Cost/No Cost Projects. These are projects which the Director of Engineering and Housing (DEH) can perform using his resources. Documentation shall be as required by the DEH.
- 5.3 Nonfeasible ECOs. All ECOs which the AE has considered but which are not feasible, shall be documented in the report with reasons and justifications showing why they were rejected.
- 6. <u>DETAILED SCOPE</u> OF WORK. The Detailed Scope of Work is contained in Annex A.

7. WORK TO BE ACCOMPLISHED.

- 7.1 Review Previous Studies. Review the previous EEAP study which applies to the specific buildings, systems, or ECOs covered by this study. This review should acquaint the AE with the work that has been performed previously. Much of the information the AE may need to develop the ECOs in this study is contained in the previous study.
- 7.2 <u>Perform a Limited Site Survey</u>. The AE shall obtain all necessary data to evaluate the ECOs or projects by conducting a site survey. However, the AE is encouraged to use any data that may have been documented in a previous study. The AE shall document his site survey on forms developed for the survey, or standard forms, and submit these completed forms as part of the report. All test and/or measurement equipment shall be properly calibrated prior to its use.
- 7.3 Reevaluate Selected Projects. The AE shall reevaluate the projects and ECOs listed in Annex A. These are projects and ECOs that the previous study has identified but that have not been accomplished or only parts have been accomplished. If the project or ECO is acceptable as is, that is, there are no changes to the basic project or ECO, the energy savings shown in the previous project may be accepted as accurate but the energy cost and construction cost estimates shall be updated based on the most current data available. With the above information the project shall

then be analyzed based on current ECIP criteria. If the project or ECO is basically acceptable but some of the buildings in the original project have been deleted or new buildings can be added, the necessary changes shall be made to the energy savings, the energy costs and construction costs shall be updated, and the revised project or ECO shall then be analyzed using current ECIP guidance. If the original project or ECO has had numerous changes made to it so that all of the numbers are suspected of being inaccurate, but the project or ECO is still considered feasible, the AE shall develop the project from the beginning and analyze it with the current ECIP guidance. These projects shall be separately listed in the report.

- 7.4 Evaluate Selected ECOs. The AE shall analyze the ECOs listed in Annex A. These ECOs shall be analyzed in detail to determine their feasibility. Savings to Investment Ratios (SIRs) shall be determined using current ECIP guidance. The AE shall provide all data and calculations needed to support the recommended ECO. All assumptions and engineering equations shall be clearly stated. Calculations shall be prepared showing how all numbers in the ECO were figured. Calculations shall be an orderly step-by-step progression from the first assumption to the final number. Descriptions of the products, manufacturers catalog cuts, pertinent drawings and sketches shall also be included. A life cycle cost analysis summary sheet shall be prepared for each ECO and included as part of the supporting data.
- 7.5 Combine ECOs Into Recommended Projects. During the Interim Review Conference, as outlined in paragraph [7.6.1], the AE will be advised of the DEH's preferred packaging of recommended ECOs into projects for implementation. Some projects may be a combination of several ECOs, and others may contain only one. These projects will be evaluated and arranged as outlined in paragraphs 5.1, 5.2, and 5.3. Energy savings calculations shall take into account the synergistic effects of multiple ECOs within a project and the effects of one project upon another. The results of this effort will be reported in the Final Submittal per par [7.6.2].
- 7.6 Submittals, Presentations and Reviews. The work accomplished shall be fully documented by a comprehensive report. report shall have a table of contents and shall be indexed. and dividers shall clearly and distinctly divide sections, subsections, and appendices. All pages shall be numbered. Names of the persons primarily responsible for the project shall be included. The AE shall give a formal presentation of the interim submittal to installation, command, and other Government personnel. Slides or view graphs showing the results of the study to date shall be used during the presentation. During the presentation, the personnel in attendance shall be given ample opportunity to ask questions and discuss any changes deemed necessary to the study. A review conference will be conducted the same day, following the presentation. Each comment presented at the review conference will be discussed and resolved or action items assigned. It is anticipated that the presentation and review conference will require approximately one working day. The presentation and review

- conference will be at the installation on the date agreeable to the Director of Engineering and Housing, the AE and the Government's representative. The Contracting Officer may require a resubmittal of any document(s), if such document(s) are not approved because they are determined by the Contracting Officer to be inadequate for the intended purpose.
- 7.6.1 Interim Submittal. An interim report shall be submitted for review after the field survey has been completed and an analysis has been performed on all of the ECOs. The report shall indicate the work which has been accomplished to date, illustrate the methods and justifications of the approaches taken and contain a plan of the work remaining to complete the study. Calculations showing energy and dollar savings, SIR, and simple payback period of all the ECOs shall be included. The results of the ECO analyses shall be summarized by lists as follows:
- a.All ECOs eliminated from consideration shall be grouped into one listing with reasons for their elimination as discussed in par 5.3.
- b.All ECOs which were analysed shall be grouped into two listings, recommended and non-recommended, each arranged in order descending SIR. These lists may be subdivided by building or area appropriate for the study. The AE shall submit the Scope of Work and any modifications to the Scope of Work as an appendix to the report. A narrative summary describing the work and results date shall be a part of this submittal. At the Interim Submittal and Review Conference, the Government's and AE's representatives shall coordinate with the Director of Engineering and Housing to provide the AE with direction for packaging or combining ECOs for programming purposes and also indicate the year for which the programming or implementation documentation shall be prepared. The survey forms completed during this audit shall be submitted with this report. The survey forms only may be submitted in final form with this submittal. They should be clearly marked at the time of submission that they are to be retained. They shall be bound in a standard three-ring binder which will allow repeated disassembly and reassembly of the material contained within.
- 7.6.2 Prefinal Submittal. The AE shall prepare and submit the prefinal report when all sections of the report are 100% complete and all comments from the interim submittal have been resolved. The AE shall submit the Scope of Work for the study and any modifications to the Scope of Work as an appendix to the submittal. The report shall contain a narrative summary of conclusions and recommendations, together with all raw and supporting data, methods used, and sources of information. The report shall integrate all aspects of the study. The recommended projects, as determined in accordance with paragraph 5, shall be presented in order of priority by SIR. The lists of ECOs specified in paragraph [7.6.1] shall also be included for continuity. The prefinal report and all appendices shall be bound in standard three-ring binders which will allow repeated disassembly and reassembly. The prefinal report shall be

arranged to include:

- a. An Executive Summary to give a brief overview of what was accomplished and the results of this study using graphs, tables and charts as much as possible (See Annex B for minimum requirements).
- b. The narrative report describing the problem to be studied, the approach to be used, and the results of this study.
- c. Documentation for the recommended projects (includes LCCA Summary Sheets).
 - d. Appendices to include as a minimum:
 - 1) Energy cost development and backup data
 - 2) Detailed calculations
 - 3) Cost estimates
 - 4) Computer printouts (where applicable)
 - 5) Scope of Work
- corrections Final Submittal. Any revisions or resulting from comments made during the review of the prefinal report shall be incorporated into the final report. revisions or corrections may be in the form of replacement pages, which may be inserted in the prefinal report, or complete new Pen and ink changes or errata sheets will not be If replacement pages are to be issued, it shall acceptable. clearly stated with the prefinal submittal that the submitted documents will be changed only to comply with the comments made during the review of the prefinal and that the volumes issued at the time of the prefinal submittal should be retained. to do so will require resubmission of complete volumes. volumes are submitted, they shall be in standard three-ring binders and shall contain all the information presented in the prefinal report with any necessary changes made. Detailed instructions of what to do with the replacement pages should be securely attached to the replacement pages.

ANNEX A

Detailed Scope of Work for Updating an Existing Energy Study Fort Carson, Colorado

- 1. This Annex contains the detailed Scope of Work for this energy study. The study shall be accomplished in accordance with the General Scope of Work and Annexes A, B, C, and D.
- This study will update two Programming Documentation. Programming Documentations that were part of the Energy Survey Opportunities Survey (Modified), Final Report for Fort Carson, Colorado, dated October 1985. The two Programming Documentations Heating, Conditioning Ventilation, and Air Conservation Improvements to Permanent Buildings (ECIP) Mechanical and Electrical Energy Conservation Improvements to Permanent Buildings (ECIP). The updating of these projects will only include some of the originally studied ECOs as shown Tables 1 and 2. Also a solar-wall, which was not previously studied, will now be studied for five buildings. The Building numbers are P-1160, P-2357, P-8030, P-8142, and P-8300. study shall emphasis the Low Cost/No Cost Projects as described in Paragraph 5.2,e. in the General Scope of Work.

(2)

(2)

(2)

(2)

- 3. Government Furnished Data. The following data and criteria is furnished for guidance and information.
- a. Energy Savings Opportunity Survey (Modified), Fort Carson, Colorado, Dated October 1985, Volume 1, Book 1, and Volume 1, Book 5. This is available from Mr. Steve Snyder, Fort Carson, Colorado, phone (719)579-3678.
- b. Architectural and Engineering Instructions, Design Criteria, dated 14 July 1989, Revised on May 1991.
- c. TM5-785 Engineering Weather Data, pages: cover, IV, V, 1-X, 3-68, 3-69, and 5-5.
- d. AR5-4, Change No. 1, Department of the Army Productivity Improvement Program.
- e. Energy Conservation Investment Program (ECIP) Guidance, dated 28 June 1991, w/o enclosure 2.
- f. CEMP-EC/CEMP-ET Memorandum, dated 10 December 1991, Subject: Economic Studies for MCA and MCAF Designs.
- g. AR415-15, 1 January 1984, Military Construction, Army (MCA) Program Development.
- h. Tri-Service Military Construction Program (MCP) Index, dated February 1991.

- 4. Life Cycle Costing Computer Program. A computer program titled Life Cycle Costing in Design (LCCID) is available from the BLAST Support Office in Urbana, Illinois for a nominal fee. This computer program can be used for performing the economic calculations for ECIP and non-ECIP ECOs. The AE is encouraged to obtain and use this computer program. The BLAST Support Office can be contacted at 144 Mechanical Engineering Building, 1206 West Green Street, Urbana, Illinois 61801. The telephone number is (217)333-3977 or (800)842-5278.
- 5. Project Coordinators at the Installation. The Fort Carson coordinator in the Directorate of Engineering and Housing for this study is Mr. Frank Lyons, phone (719)579-2856/5662. The Fort Carson coordinator in the Directorate of Environmental Compliance and Management is Mr. Steve Snyder, phone (719)579-3678. Their addresses are shown in Annex D.
- 6. <u>Copies of Report Required</u>. The number of copies for each addressee shall be as shown in Annex D. All copies shall be sent directly to the addresses as shown in Annex D.

Calendar Days From Schedule for Study. Notice To Proceed (1)42)195 days Interim Submittal: 225 days (1)(2)Government's Review: 255 days (1)(2)c. Prefinal Submittal: 285 days (1)(2)Government's Review: d. 300 days (1)(2)Final Submittal Corrected:

8. Scheduling and Reporting Progress. The Contractor shall prepare and submit an activity diagram or schedule, which will indicate individual activities, significant events and milestones along with schedule dates. The schedule shall cover the entire scope and work period of the contract. In addition, the Contractor shall submit monthly reports of progress. These reports shall be in letter and chart form and should be worded or keyed to indicate progress on the activity diagram and shall describe work accomplished in the immediate past and work to be done in the immediate future. Monthly reports shall be sent to the addressees numbered 4,6, and 8 as shown in Annex D.

TABLE 1 - ECOs to Apply

Project to Update: Heating, Ventilation, and Air Conditioning Energy Conservation Improvements to Permanent Buildings (ECIP).

ECO #			<u>Name</u>			
14 16 19			Night Setback. Economizer Cycle. Radiator Controls.			(1)
31			List HVAC Controls trepaired or replaced can do this work.			(2) (2) (2) (2)
BLDG #	ECO 14	ECO 16	ECO 19	ECO 31	SIMILARITY	(1)(2) (1)(2)
P-1007 P-1150	x			X X	PRIMARY S to 1007	(2)
P-1118 P-1217 P-1218 P-1219 P-1220 P-1363 P-1364 P-1365 P-1366 P-1367 P-1664 P-1665 P-1666 P-1667 P-1227 P-1446 P-1526 P-1528				X X X X X X X X X X X X	PRIMARY I to 1118 I to 1363 PRIMARY PRIMARY PRIMARY	
P-1855 P-1864				x x	PRIMARY PRIMARY	(2)
						(1)

(1)

(1) (1)

(1)

(1)

BLDG #	ECO 14	ECO 16	ECO 19	ECO 31	SIMILARITY	(2) (2)
π	14	10				
						(1)
						(1)
						(1)
						(1) (1)
						(1)
						(1) (1)
						(1)
						(1)
						(1) (1)
						(1)
						(1) (1)
	-					(1)
						(1)
						(1) (1)
						(1)
						(1) (1)
						, ,
P-1955 P-1956	X X			Х	PRIMARY I to 1955	
P-2055	X			X	I to 1955	
P-2056	X			X X	I to 1955 I to 1955	
P-2155 P-2156	X X			X	I to 1955	
			·			
P-1957 P-1958				X X	PRIMARY I to 1957	
P-2057				x	S to 1957	
P-2058				X	I to 2057	
P-2157 P-2158				X X	I to 2057 I to 2057	
P-2257				X	I to 2057	
P-2258				X X	S to 1957 S to 1957	
P-2457 P-2458				X	I to 2457	
P-2557				X	I to 2457	
P-2558				X	I to 2457	
P-2350				X	PRIMARY	(2)
P-1853				X X	S to 2350 I to 1853	(2) (2)
P-2060 P-2160				X X	I to 1853	(2)
				_		,

BLDG #	ECO 14	ECO 16	ECO 19	ECO 31	SIMILARITY	(2) (2)
P-2352 P-2700	x			x x	I to 2350 S to 2350	
P-2357 P-1856				X X	PRIMARY S to 2357	
P-2359 P-1850		X X		X X	PRIMARY I to 2359	(2) (2)
S-6220 S-6221 S-6222 S-6223 S-6224 S-6233 S-6236 S-6237 S-6243		-	X X X X X X X		PRIMARY I to 6220	(1) (1) (1) (1) (1) (1) (1)
S-6230* S-6231 S-6234 S-6235 S-6240 S-6241 S-6244 S-6252 S-6253 S-6254 S-6255			x x x x x x x x x		PRIMARY I to 6230	(1) (1) (1) (1) (1) (1) (1) (1) (1)
P-8000				х	PRIMARY	(1)
P-8030				x	PRIMARY	(1)
P-8142				х	PRIMARY	(1)

^{*} Building #S-6230, ECO 19, was not included in the programming documentation in the original study, but was analyzed and the results shown in Volume 1, Book 3, Page N-591 of the original study.

TABLE 2 - ECOs to Apply

Project to Update: Mechanical and Electrical Energy Conservation Improvements to Permanent Buildings (ECIP).

ECO #		Name		
13 31	L		cy Motors. trols that need to be repaired o Ft Carson can do this work.	(2) (2)
BLDG	ECO 13	ECO 31	SIMILARITY	(2) (2)
P-1950 P-2070 P-2153 P-2250 P-1951 P-1952 P-1953 P-1954 P-2050 P-2051 P-2052 P-2052 P-2074 P-2071 P-2072 P-2073 P-2074 P-2074	X X X X X X X X X X X X X	X X X X X X X X X X X X X X X	PRIMARY I to 1950 I to 1950 I to 1950 PRIMARY I to 1951	(2) (2) (2) (2) (2) (2) (2) (2) (2) (2)
P-2151 P-2152 P-2154 P-2251 P-2252 P-2253 P-2254 P-2450 P-2451 P-2452 P-2453 P-2454 P-2350 P-1853	X X X X X X X X X X X	X X X X X X X X X X X X	I to 1951 I to 2450 I to 2450 I to 2450 I to 2540 PRIMARY S to 2350	(2) (2) (2) (2) (2) (2) (2) (2) (2) (2)
P-2060 P-2160 P-2352 P-2700 P-8000 P-8030 P-8142	X X X X X X	X* X* X* X* X* X*	I to 1853 I to 1853 I to 2350 S to 2350 PRIMARY PRIMARY PRIMARY	(2) (2) (2) (2) (2) (2) (2)

^{*} Shown also on Table 1.

ANNEX B

EXECUTIVE SUMMARY GUIDELINE

- 1. Introduction.
- Building Data (types, number of similar buildings, sizes, etc.)
- 3. Present Energy Consumption of Buildings or Systems Studied.
 - o Total Annual Energy Used.
 - o Source Energy Consumption.

Electricity - KWH, Dollars, BTU
Fuel Oil - GALS, Dollars, BTU
Natural Gas - THERMS, Dollars, BTU
Propane - GALS, Dollars, BTU
Other - QTY, Dollars, BTU

- 4. Reevaluated Projects Results.
- 5. Energy Conservation Analysis.
 - o ECOs Investigated.
 - o ECOs Recommended.
 - o ECOs Rejected. (Provide economics or reasons)
 - o ECIP Projects Developed. (Provide list)*
 - o Non-ECIP Projects Developed. (Provide list) *
 - o Operational or Policy Change Recommendations.
- * Include the following data from the life cycle cost analysis summary sheet: the cost (construction plus SIOH), the annual energy savings (type and amount), the annual dollar savings, the SIR, the simple payback period and the analysis date.
- Energy and Cost Savings.
 - o Total Potential Energy and Cost Savings.
 - o Percentage of Energy Conserved.
 - o Energy Use and Cost Before and After the Energy Conservation Opportunities are Implemented.

ANNEX C

REQUIRED DD FORM 1391 DATA

To facilitate ECIP project approval, the following supplemental data shall be provided:

- a. In title block clearly identify projects as "ECIP."
- b. Complete description of each item of work to be accomplished including quantity, square footage, etc.
- c. A comprehensive list of buildings, zones, or areas including building numbers, square foot floor area, designated temporary or permanent, and usage (administration, patient treatment, etc.).
- d. List references, and assumptions, and provide calculations to support dollar and energy savings, and indicate any added costs.
- (1) If a specific building, zone, or area is used for sample calculations, identify building, zone or area, category, orientation, square footage, floor area, window and wall area for each exposure.
 - (2) Identify weather data source.
- (3) Identify infiltration assumptions before and after improvements.
- (4) Include source of expertise and demonstrate savings claimed. Identify any special or critical environmental conditions such as pressure relationships, exhaust or outside air quantities, temperatures, humidity, etc.
- e. Claims for boiler efficiency improvements must identify data to support present properly adjusted boiler operation and future expected efficiency. If full replacement of boilers is indicated, explain rejection of alternatives such as replace burners, nonfunctioning controls, etc. Assessment of the complete existing installation is required to make accurate determinations of required retrofit actions.
- f. Lighting retrofit projects must identify number and type of fixtures, and wattage of each fixture being deleted and installed. New lighting shall be only of the level to meet current criteria. Lamp changes in existing fixtures is not considered an ECIP type project.

- g. An ECIP life cycle cost analysis summary sheet as shown in the ECIP Guidance shall be provided for the complete project and for each discrete part included in the project. The SIR is applicable to all segments of the project. Supporting documentation consisting of basic engineering and economic calculations showing how savings were determined shall be included.
- h. The DD Form 1391 face sheet shall include, for the complete project, the annual dollar and MBTU savings, SIR, simple amortization period and a statement attesting that all buildings and retrofit actions will be in active use throughout the amortization period.
- i. The calendar year in which the cost was calculated shall be clearly shown on the DD Form 1391.
- j. For each temporary building included in a project, separate documentation is required showing (1) a minimum 10-year continuing need, based on the installation's annual real property utilization survey, for active building retention after retrofit, (2) the specific retrofit action applicable and (3) an economic analysis supporting the specific retrofit.
- k. Nonappropriated funded facilities will not be included in an ECIP project without an accompanying statement certifying that utility costs are not reimbursable.
- 1. Any requirements required by ECIP guidance dated 25 April 1988 and any revisions thereto. Note that unescalated costs/savings are to be used in the economic analyses.
- m. The five digit category number for all ECIP projects except for Family Housing is 80000. The category code number for Family Housing projects is 71100.

ANNEX D Distribution Address List for Report

- 1. Commander
 U.S. Army Engineer District, Mobile
 ATTN: CESAM-EN-CC (T. Battaglia)
 P.O. Box 2288
 Mobile, AL 36628-0001
 1 Copy of Corrected Final
- 2. HQDA
 ATTN: DALO-TSE (LTC H. Corley)
 Pentagon
 Washington, D.C. 20310-0561
 1 Copy of Executive Summary
- Commander
 U.S. Army Corps of Engineers
 ATTN: CEMP-ET (H. Torabi)
 Massachusetts Avenue, NW
 Washington, D.C. 20314-1000
 Copy of Executive Summary
- 4. Commander
 HQ FORSCOM
 ATTN: FCEN-RDF-K (N. Kapur)
 Fort McPherson, GA 30330-6000
 1 Copy
- 5. Commander U.S. Army Engineer Division, Missouri River ATTN: CEMRD-MD-MA (J. Whelchel) P.O. Box 103, Downtown Station Omaha, NE 68102-4978 1 Copy
- 6. Commander U.S. Army Engineer District, Omaha ATTN: CEMRO-ED-ME (S. Owens) 215 North 17th Street Omaha, NE 68102-4978 3 Copies
- 7. Commander
 HQS, Fort Carson & HQS, 4th Infantry Div. (Mech)
 ATTN: AFZC-FE-ME (F. Lyons)
 Building 304
 Fort Carson, CO 80913-5023
 2 Copies
- 8. Commander
 HQS, Fort Carson & HQS, 4th Infantry Div. (Mech)
 ATTN: AFZC-ECM-EM (S. Snyder)
 Building 302
 Fort Carson, CO 80913-5023
 2 copies

CONFIRMATION NOTICE

Confirmation No.: 4 EMC #2101-001

DATE:

1 March 1993

To/From: Stan Owen

Representing: Omaha District Corps of Engineers

PROJECT:

Updating an Existing Energy Study, Ft. Carson, CO

CONTRACT No.: DACA 45-91-D-0009

NOTICE

Eric J. Young

PREPARED BY:

E M C Engineers, Inc.

SUBJECT:

Scope of Work

The following is a summary of the items discussed, comments, and decisions made during the meeting at Stan Owen's office.

The Scope of Work was revised on 20 January 1993 and has been reviewed, and the following is the result of the revision:

1. ECO 31 (HVAC Controls) was redefined to require EMC to identify needed control system component repairs to make the HVAC systems ready to receive the UCS system being designed under another contract.

The new DDC controls will interface with the existing control valve and damper actuators. All other control elements will be replaced under the new design. We will review the condition of the existing actuators.

There were 29 buildings added to the ECO 31 list that will require survey.

- 2. Buildings 8000, 8030 and 8142 were added to ECO 13 (High Eff. Motors), which requires more survey and analysis work. There are many motors in these buildings.
- 3. The number of buildings to be analyzed for solar wall concept was increased from three to five.

The effects of these changes in the Scope of Work on the original proposed effort are as follows:

1. The potential for packaging ECOs in an ECIP project that have synergistic interactions has been eliminated by the redefinition of ECO 31 since there are no longer several differing ECOs impacting the same energy system.

Confirmation No. 4 EMC #2101-001 Page 2

2. The cost of implementing the new group of ECOs is much less than the original program that included energy savings from ECO 31, and it is very unlikely that the remaining ECOs together will reach \$300,000. (If two of the solar wall buildings had qualified for retrofit, the \$300,000 would have been reached, but none qualified).

Other recent changes have impacted the contract, and are:

- 1. The cost of natural gas at Ft. Carson is lower now than in 1985 when the first ECIP study was completed, and construction costs are higher. The SIRs are worse now than previously on ECOs where heating is involved (ECO 14, ECO 19).
- 2. The new ECIP guidelines have changed the economic life of the various ECOs from 25 years to 15 years, or even 10 years, which also adversely impacts the SIR for the ECOs.

Therefore, the modification of the Scope of Work will mean:

- 1. ECOs 13, 14, 16, and 19 will probably qualify for implementation, but will not total enough in cost to qualify for ECIP funding. They will most likely have to be done under the OMA program budget.
- 2. ECO 31 is no longer an ECO since there are no energy savings involved in repairing dampers and damper and valve actuators. What is involved is restoring the mechanical systems to the intended baseline or design condition.
- 3. In view of no.'s 1 and 2 above, the usual prefinal phase activities below are unnecessary:
 - Package ECO for implementation under ECIP/QRIP/OSO-PIF/PECIP programs.
 - Redetermine the cost effectiveness of each ECO as part of the package.
 - Prepare program documentation for each package.

The engineering costs of performing the new work under the modified Scope of Work is estimated to be the same as performing the prefinal work as negotiated in our contract.

Confirmation No. 4 EMC #2101-001 Page 3

We recommend the following action, and have received concurrence of Stan Owen to proceed as follows:

Eliminate the entire prefinal phase submittal of the project since there is no longer a purpose for the submittal. Substitute the additional work in the Revised Scope of Work that includes 29 additional buildings for ECO 31, three additional buildings for ECO 13, and two additional buildings for the solar wall study. EMC will not provide any program documentation.

Eric J. Young

EJY/sgh(26)

If any portion of this confirmation notice is incorrect, please notify us immediately. If correspondence is not received to the contrary within 14 days, it will be assumed that the decisions and conclusions, and status outline in this confirmation notice is correct.

CONFIRMATION NOTICE

Confirmation No.: 3 EMC #2101-001

DATE:

7 December 1992

To/From: Stan Owen

Representing: Omaha District Corps of Engineers

PROJECT:

Updating an Existing Energy Study, Ft. Carson, CO

CONTRACT No.: DACA 45-91-D-0009

NOTICE

Eric J. Young

PREPARED BY: E M C Engineers, Inc.

SUBJECT:

Scope of Work

The following is a summary of the items discussed, comments, and decisions made during the telephone conversation.

During the last several weeks, it has been determined that another project substantially overlaps this project in scope. That project is the Utility Control System Upgrade, conducted by the Huntsville Division Corps of Engineers for the Ft. Carson site. The project is being designed by Newcomb Boyd Engineers and Consultants in Atlanta, Georgia. We have been in contact with representatives of that firm to determine the overlap.

The overlap in scope appears to be in the control work indicated in ECO 31 and ECO 14 of our scope of work, and could affect the recommendations for ECO #13.

Buildings that should be deleted from ECO 31 in our contract because of overlap include:

P-1118	P-2350	P-2357
P-1217	P-1853	P-1856
P-1218	P-2060	P-8000
P-1219	P-2160	P-8030
P-1526	P-2352	P-8142
P-1528		

Buildings in which partial deletion from ECO 31 should be considered for our contract due to the overlap include:

P-1957	P-2157	P-2457
P-1958	P-2158	P-2458
P-2057	P-2257	P-2557
P-2058	P-2258	P-2558

Building that should be deleted from ECO #14 in our contract because of overlap include:

P-2350 P-1853 P-2060

P-2160

Confirmation No. 3 EMC #2101-001 Page 2

At least 17 of the 35 buildings listed for ECO #13 are impacted by the overlap in reduced motor run times. Possibly 17 additional buildings will be impacted, but this is unknown at this time. Only Building P-2700 is not impacted.

There are six additional buildings that should be confirmed in the scope of work, buildings that may be slated for demolition. No clear direction has been received on these buildings. They are:

P-1220	P-1364	P-1366
P-1363	P-1365	P-1367

The buildings listed above represent a substantial portion of the work under this contract. Deleting the buildings above would drastically reduce the size of the study we are conducting. Unfortunately, a substantial portion of our work has already been expended on the buildings that should be deleted, including: the field investigation; and portions of the technical analysis, economical analysis, and cost estimates. Completion of those tasks and the interim report for those buildings has not yet been expended.

In reviewing the above overlap, it was determined by Stan Owen and Eric Young that the project should be stopped at this point, and put on temporary hold until a modification to the contract redirection our effort can be issued. The interim report will not be submitted as scheduled.

I mentioned to Stan Owen that Will White at Ft. Carson possibly has several other buildings and ECOs he is interested in adding to the scope. Any modification should include those buildings if desired.

A request for modification to change the scope to delete Building 8000 from the solar wall study, and to add Buildings 8300, 1160, and 2351 to the solar wall studies has not yet been received. A modification to the contract should also include this change.

Eric J. Young

EJY/sgh(15)

If any portion of this confirmation notice is incorrect, please notify us immediately. If correspondence is not received to the contrary within 14 days, it will be assumed that the decisions and conclusions, and status outline in this confirmation notice is correct.

CONFIRMATION NOTICE

Confirmation No.

003

EMC #2102-001

DATE:

23 Nov. 92

PROJECT:

Fort Carson EEAP Update

CONTRACT NO:

DACA45-91-D-0009

NOTES

PREPARED BY:

T. FORSTER

DATE OF

CONFERENCE:

22 Nov 92

PLACE OF

CONFERENCE:

Ft. Carson AFZC-EMC office

SUBJECT:

Interim Report Format and Content

ATTENDANTS:

Steve Snyder, AFZC-EMC R. W. White, AFZC-EMC

T.Forster, EMC Engineers, Inc.

T. Forster presented a summary of the project goals, and an outline for the format and content of the interim and prefinal reports. These items were reviewed and accepted by R. White and S. Evans. Forster presented a recommended format for the building survey forms which was reviewed and accepted (attachment #1).

The overlap of the current UCS design project and ECO 31 of this contract was discussed. R. White provided UCS design drawings for Delivery Orders #2 and #3 to Forster for used in determining the exact points that will be included in the UCS design. Forster agreed that EMC would deterraine the extent of conflict between this contract and the "UCS project, and advise AFZC-EMC as soon as possible.

R. White delivered to EMC the October 1992 amendment to the NBS Handbook for LCCA, and a copy of a CERL Lighting Technology paper.

APPENDIX B

BACKUP DATA CONSERVAL SOLARWALL

SOLAR WALL EVALUATION

FORT CARSON

BUILDING

1160

Gymnasium

VENTILATION RATE	VENT	6,000 cfm
WALL AREA	AREA	1,111 ft2
COLLECTOR EFFICIENCY	EFF	65%
AIR HEAT CONTENT	CP	0.83 Btuh/F/cfm
DAYS PER WEEK	DAYS	5
SYSTEM COST	FIRST	17.88 \$/ft2
ENERGY COST	COST	3.48 \$/MBTU
BOILER EFFICIENCY	BOIL	70%

		D 4111/	D 4 0E				
		DAILY	BASE				
		SOUTH	40				
		WALL	DEGREE	AMBIENT	SOLAR	HEATING	SOLAR
MONTH	DAYS	INSOL	DAYS	TEMP	HEAT	LOAD	FRACTION
		Btu/ft2	F-days	F	MBtu	MBtu	
JAN	31	1421	356	29	23	30	75%
FEB	28	1384	273	31	20	23	86%
MAR	31	1223	207	35	18	18	100%
APR	30	940	77	46	7	7	100%
MAY	31	696	29	56	2	2	100%
JUN	30	610	0	65	0	0	0%
JUL	31	647	0	71	0	0	0%
AUG	31	831	0	69	0	0	0%
SEP	30	1170	0	61	0	0	0%
ОСТ	31	1438	72	50	6	6	100%
NOV	30	1379	146	38	12	. 12	100%
DEC	31	1227	302	31	20	26	76%
YR	365	1080.5	1,461		108	125	86%

ESTIMATED FIRST COST	\$19,867
ANNUAL ENERGY COST SAVINGS	\$535
SIMPLE PAYBACK (yrs)	37.1
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$5,089
SIR	0.3
INTERNAL RATE OF RETURN	-9.24%

⁽¹⁾ Natural gas, 4% discount rate, 10 year life, Region 4.

SOLAR WALL EVALUATION FORT CARSON BUILDING 2357 Gymnasium

VENTILATION RATE WALL AREA	VENT AREA	2,825 cfm 523 ft2
COLLECTOR EFFICIENCY AIR HEAT CONTENT	EFF CP	65% 0.83 Btuh/F/cfm
DAYS PER WEEK SYSTEM COST	DAYS FIRST	17.88 \$/ft2
ENERGY COST BOILER EFFICIENCY	COST BOIL	3.48 \$/MBTU 70%

MONTH	DAYS	DAILY SOUTH WALL INSOL Btu/ft2	BASE 65 DEGREE DAYS F-days	AMBIENT TEMP F	SOLAR HEAT MBtu	HEATING LOAD MBtu	SOLAR FRACTION
JAN	31	1421	1,116	29	15	63	24%
FEB	28	1384	952	31	13	54	25%
MAR	31	1223	930	35	13	52	25%
APR	30	940	572	46	10	32	30%
MAY	31	696	302	56	7	17	43%
JUN	30	610	118	65	6	7	93%
JUL	31	647	79	71	4	4	100%
AUG	31	831	87	69	5	5	100%
SEP	30	1170	181	61	10	10	100%
l oct l	31	1438	470	50	15	26	57%
NOV	30	1379	810	38	14	46	31%
DEC	31	1227	1,054	31	13	59	22%
YR	365	1080.5	6,671		126	375	34%

ESTIMATED FIRST COST	\$9,354
ANNUAL ENERGY COST SAVINGS	\$626
SIMPLE PAYBACK (yrs)	14.9
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SÁVINGS	\$5,952
SIR	0.6
INTERNAL RATE OF RETURN	-0.60%

(1) Natural gas, 4% discount rate, 10 year life, Region 4.

S8030BAS.XLS

SOLAR WALL EVALUATION
FORT CARSON
BUILDING 8030
Maintenance Shop

BASELINE - Heat wheel operational -

VENTILATION RATE	VENT	153,000	ctm
WALL AREA	AREA	14,160	ft2
COLLECTOR EFFICIENCY	EFF	0%	
AIR HEAT CONTENT	CP	0.83	Bluh/F/cim
DAYS PER WEEK	DAYS	7	
SYSTEM COST	FIRST	17.88	\$/#2
ENERGY COST	COST	3.48	\$/MBTU
HEAT WHEEL EFFECTIVENESS	HWE	71%	
AVERAGE SOLAR TEMP RISE (24 HRS)		0	
ROOM TEMPERATURE	ROOM	64	
BOILER EFFICIENCY	BOIL	70%	1

		DAILY SOUTH	BASE 64					VENT	
		WALL	DEGREE	AMBIENT	SOLAR	HEAT	GA\$	HEATING	SOLAR
MONTH	DAYS	INSOL	DAYS	TEMP	HEAT	WHEEL	HEAT	LOAD	FRACTION
		B1u/112	F-days	F	MBtu	MBtu	MBtu	MBtu	
JAN	31	1421	1,085	29	Q	2,348	959	3,307	0%
FEB	28	1384	924	31	0	1,999	817	2.816	0%
MAR	31	1223	899	35	0	1,945	795	2.740	0%
APR	30	940	542	46	O O	1,169	484	1,653	0%
MAY	31	696	276	56	0	537	306	843	0%
אטע	30	610	٥	65	O	0	0	0	0%
JUL	31	647	٥	71	Ò	۵	0	0	0%
AUG	31	831	0	69	0	0	0	. 0	0%
SEP	30	1170	162	61	0	195	300	495	0%
OCT	31	1438	441	50	٥	939	405	1,344	Q%.
NOV	30	1379	780	38	٥	1,688	690	2,378	Ο%
DEC	31	1227	1,023	31 _	0	2,214	904	3,118	0%
YR	365	1080.5	6,133		С	13,033	5,660	18,693	0%

BASELINE ANNUAL ENERGY COST \$28,138

SOLAR WALL EVALUATION FORT CARSON

BUILDING

8030

Maintenance Shop

Solar wall added to system with operational heat wheel

VENTILATION RATE .	VENT	153,000	cfm
WALL AREA	AREA	14,160	ft2
COLLECTOR EFFICIENCY	EFF	68%	
AIR HEAT CONTENT	CP	0.83	Btuh/F/cfm
DAYS PER WEEK	DAYS	7	
SYSTEM COST	FIRST	17.88	\$/ft2
ENERGY COST	COST	3.48	\$/MBTU
HEAT WHEEL EFFECTIVENESS	HWE	71%	
AVERAGE SOLAR TEMP RISE (24 HR	RS)	3.86	
ROOM TEMPERATURE	ROOM	64	
BOILER EFFICIENCY	. BOIL	70%	
BOILER EFFICIENCY	BOIL	70%	

		DAILY	BASE						
		SOUTH	64				•	VENT	
		WALL	DEGREE	AMBIENT	SOLAR	HEAT	GAS	HEATING	SOLAR
MONTH	DAYS	INSOL	DAYS	TEMP	HEAT	WHEEL	HEAT	LOAD	FRACTION
		Btu/ft2	F-days	F	MBtu	MBtu	MBtu	MBtu	
JAN	31	1421	1,085	29	424	2,089	794	3,307	13%
FEB	28	1384	924	31	373	1,766	677	2,816	13%
MAR	31	1223	899	35	365	1,687	688	2,740	13%
APR	30	940	542	46	272	918	463	1,653	16%
MAY	31	696	276	56	208	278	357	843	25%
JUN	30	610	0	65	0	0	0	0	0%
JUL	31	647	0	71	0	0	0	0	0%
AUG	31	831	0	69	0	0	0	0	0%
SEP	30	1170	162	61	338	0	157	495	68%
OCT	31	1438	441	50	429	680	234	1,344	32%
NOV	30	1379	780	38	398	1,438	542	2,378	17%
DEC	31	1227	1,023	31	366	1,955	797	3,118	12%
YR	365	1080.5	6,133		3,173	10,811	4,709	18,693	17%

ESTIMATED FIRST COST	\$253,181
BASELINE ANNUAL ENERGY COST	\$28,138
ANNUAL ENERGY COST	\$23,410
ANNUAL ENERGY COST SAVINGS	\$4,727
SIMPLE PAYBACK (yrs)	53.6
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$44,955
SIR	0.2
INTERNAL RATE OF RETURN	-12.51%

⁽¹⁾ Natural gas, 4% discount rate, 10 year life, Region 4.

SOLAR WALL EVALUATION FORT CARSON BUILDING 8142/A&B Maintenance Shop

VENTILATION RATE	VENT	14,625 cfr	n
WALL AREA	AREA	2,708 ft2	
COLLECTOR EFFICIENCY	EFF	65%	
AIR HEAT CONTENT	CP	0.83 Btu	uh/F/cfm
DAYS PER WEEK	DAYS	5	
HOURS PER DAY	HOURS	10	
SYSTEM COST	FIRST	17.88 \$/f	†2
ENERGY COST	COST	3.48 \$/1	MBTU
BOILER EFFICIENCY	BOIL	70%	

		DAILY	BASE				
		SOUTH	65				
		WALL	DEGREE	AMBIENT	SOLAR	HEATING	SOLAR
MONTH	DAYS	INSOL	DAYS	TEMP	HEAT	LOAD	FRACTION
		Btu/ft2	F-days	F	MBtu	MBtu	
JAN	31	1421	1,116	29	55	97	57%
FEB	28	1384	952	31	49	83	59%
MAR	31	1223	930	35	48	81	59%
APR	30	940	572	46	35	50	72%
MAY	31	696	302	56	26	26	100%
JUN	30	610	0	65	0	0	0%
JUL	31	647	0	71	0	0	0%
AUG	31	831	0	69	0	0	0%
SEP	30	1170	181	61	16	16	100%
ОСТ	31	1438	470	50	41	41	100%
NOV	30	1379	810	38	52	70	74%
DEC	31	1227	1,054	31	48	91	52%
YR	365	1080.5	6,387		370	554	67%

ESTIMATED FIRST COST	\$48,425
ANNUAL ENERGY COST SAVINGS	\$1,838
SIMPLE PAYBACK (yrs)	26.3
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$17,480
SIR	0.4
INTERNAL RATE OF RETURN	-6.08%

⁽¹⁾ Natural gas, 4% discount rate, 10 year life, Region 4.

SOLAR WALL EVALUATION
FORT CARSON
BUILDING 8142/E
Maintenance Shop

VENTILATION RATE	VENT	9,120 cfm
WALL AREA	AREA	1,689 ft2
COLLECTOR EFFICIENCY	EFF	. 65%
AIR HEAT CONTENT	СР	0.83 Btuh/F/cfm
DAYS PER WEEK	DAYS	5
HOURS PER DAY	HOURS	10
SYSTEM COST	FIRST	17.88 \$/ft2
ENERGY COST	COST	3.48 \$/MBTU
BOILER EFFICIENCY	BOIL	70%

		DAILY	BASE				
		SOUTH	65				
		WALL	DEGREE	AMBIENT	SOLAR	HEATING	SOLAR
MONTH	DAYS	INSOL	DAYS	TEMP	HEAT	LOAD	FRACTION
	5,110	Btu/ft2	F-days	F	MBtu	MBtu	
JAN	31	1421	1,116	29	35	60	57%
FEB	28	1384	952	31	30	51	59%
MAR	31	1223	930	35	30	50	59%
APR	30	940	572	46	22	31	72%
MAY	31	696	302	56	16	16	100%
JUN	30	610	0	65	0	0	0%
JUL	31	647	O	71	0	0	0%
AUG	31	831	0	69	0	0	0%
SEP	30	1170	181	61	10	10	100%
OCT	31	1438	470	50	25	25	100%
NOV	30	1379	810	38	32	44	74%
DEC	31	1227	1,054	31	30	57	52%
YR	365	1080.5	6,387		231	345	67%

ESTIMATED FIRST COST	\$30,197
ANNUAL ENERGY COST SAVINGS	\$1,146
SIMPLE PAYBACK (yrs)	26.3
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$10,900
SIR	0.4
INTERNAL RATE OF RETURN	-6.08%

⁽¹⁾ Natural gas, 4% discount rate, 10 year life, Region 4.

SOLAR WALL EVALUATION FORT CARSON BUILDING 8300/C Maintenance Shop

VENTILATION RATE	VENT	26,420 cfm
WALL AREA	AREA	1,872 ft2
COLLECTOR EFFICIENCY	EFF	65%
AIR HEAT CONTENT	CP	0.83 Btuh/F/cfm
DAYS PER WEEK	DAYS	5
HOURS PER DAY	HOURS	10
SYSTEM COST	FIRST	17.88 \$/ft2
ENERGY COST	COST	3.48 \$/MBTU
BOILER EFFICIENCY	BOIL	70%

		DAILY	BASE				
		SOUTH	65			;	
	i	WALL	DEGREE	AMBIENT	SOLAR	HEATING	SOLAR
MONTH	DAYS	INSOL	DAYS	TEMP	HEAT	LOAD	FRACTION
		Btu/ft2	F-days	F	MBtu	MBtu	
JAN	31	1421	1,116	29	38	175	22%
FEB	28	1384	952	31	34	149	23%
MAR	31	1223	930	35	33	146	23%
APR	30	940	572	46	25	90	27%
MAY	31	696	302	56	19	47	40%
JUN	30	610	0	65	0	0	0%
JUL	31	647	0	71	0	0	0%
AUG	31	831	0	69	0	0	0%
SEP	30	1170	181	61	28	28	100%
ОСТ	31	1438	470	50	39	74	53%
NOV	30	1379	810	38	36	127	28%
DEC	31	1227	1,054	31	33	165	20%
YR	365	1080.5	6,387		284	1,000	28%

ESTIMATED FIRST COST	\$33,471
ANNUAL ENERGY COST SAVINGS	\$1,413
SIMPLE PAYBACK (yrs)	23.7
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$13,438
SIR	0.4
INTERNAL RATE OF RETURN	-5.07%

⁽¹⁾ Natural gas, 4% asscount rate, 10 year life, Region 4.

SOL8300E.XLS

SOLAR WALL EVALUATION FORT CARSON BUILDING 8300/E Maintenance Shop

VENTILATION RATE	VENT	26,420 cfm
WALL AREA	AREA	2,172 ft2
COLLECTOR EFFICIENCY	EFF	65%
AIR HEAT CONTENT	CP	0.83 Btuh/F/cfm
DAYS PER WEEK	DAYS	5
HOURS PER DAY	HOURS	10 .
SYSTEM COST	FIRST	17.88 \$/ft2
ENERGY COST	COST	3.48 \$/MBTU
BOILER EFFICIENCY	BOIL	70%

		5.41137	0.4.05		****		
		DAILY	BASE				
		SOUTH	65				
		WALL	DEGREE	AMBIENT	SOLAR	HEATING	SOLAR
MONTH	DAYS	INISOL	DAYS	TEMP	HEAT	LOAD	FRACTION
		Btu/ft2	F-days	F	MBtu	MBtu	
JAN	31	1421	1,116	29	44	175	25%
FEB	28	1384	952	31	39	149	26%
MAR	31	1223	930	35	38	146	26%
APR	30	940	572	46	28	90	32%
MAY	31	696	302	56	22	47	46%
JUN	30	610	0	65	0	0	0%
JUL	31	647	0	71	0	0	0%
AUG	31	831	0	69	0	0	0%
SEP	30	1170	181	61	28	28	100%
OCT	31	1438	470	50	45	74	61%
NOV	30	1379	-810	38	42	127	33%
DEC	31	1227	1,054	31	38	165	23%
YR ·	365	1080.5	6,387		325	1,000	33%

ESTIMATED FIRST COST	\$38,835
ANNUAL ENERGY COST SAVINGS	\$1,617
SIMPLE PAYBACK (yrs)	24.0
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$15,377
SIR	0.4
INTERNAL RATE OF RETURN	-5.20%

⁽¹⁾ Natural gas, 4% discount rate, 10 year life, Region 4.



Conserval

THE ENERGY PRODUCING WALL CLADDING FOR FRESH AIR HEATING

SCHRWALL

CONSERVAL, THE COMPANY

Conserval Engineering Inc. was formed in 1977 by a group of senior engineers having a broad range of experience in the consulting and contracting fields. They pooled their many talents to develop innovative applications of solar heating and energy conservation technologies.

The company adopted a total systems approach to its projects including design, engineering, component fabrication, equipment procurement, installation, operation and service. This single source responsibility allowed Conserval's engineers to develop unique, efficient and reliable products. Now the benefit of this experience is available to all building designers and architects with the extensively tested and field proven SOLARWALL® heater.

The Conserval group of companies and representatives span the USA, Canada and Europe with projects as far away as the South Pole.

MOST ENERGY EFFICIENT WALL

Most walls, even if well insulated. lose heat. The SOLARWALL® system is unique in that the heat loss of the wall is returned back inside the building together with solar heat absorbed by the air. (fig. 3) With virtually zero heat loss plus the heat generated on the wall. the SOLARWALL® has the highest energy efficiency available. Adding insulation to a south wall without the benefit of the SOLARWALL® system may miss half of the potential energy savings. Specify SOLARWALL® for maximum energy efficiency and free heat. Imagine what this means to a building owner - increased revenue from lower heating bills; and to the building designer - an opportunity to be creative while improving the environment and at virtually no additional cost to the Client.

HOW THE SOLARWALL® SYSTEM WORKS

The metal cladding on the walls becomes the heater for outside air entering the building. Dark metal heats up when exposed to the sun. The SOLARWALL® cladding allows this heat to be collected and put to use. Surprisingly, it even works on cloudy days and at night. Diffuse light can account for 25% of the total solar radiation available on a sunny day. At night, if the fan is on, the wall actually becomes a huge heat exchanger with the building heat loss passing through the wall being picked up by the incoming air and brought back into the building. The net result is a wall with an equivalent insulating value of RSI 10 (R 55).

The solar cladding is covered with tiny holes to allow outside air to travel through the face of the cladding. As outside air passes through the panel, it absorbs the solar generated heat. A ventilation fan creates negative pressure in the wall cavity to draw air through the holes. The hot air then rises to the top of the wall by the stack effect, where it is collected in an attractive canopy plenum and ducted to the nearest fan. (fig. 1)

effect, where it is collected in an attractive canopy plenum and ducted to the nearest fan. (fig. 1)
On sunny days the temperature rise over ambient air can be between 17°C to 30°C (30°F to 54°F) depending on air flow rates. On cloudy days or at night, it will function as a preheater with a lower temperature

The premium coatings on the SOLARWALL® cladding are available in several dark colors. Various panel profiles are available from deep grooved shapes which have sufficient internal air space capacity to shallower profiles (see fig. 7) which would be mounted out from the main wall. The canopy plenum provides the cross sectional area necessary to collect the heated air rising up the SOLARWALL* cladding and duct it to ventilation fans which can be inside the building. on the roof or in a penthouse. In systems with a low air flow rate, the top plenum can be incorporated within the SOLARWALL® cladding.

When the SOLARWALL® cladding is applied to industrial buildings with Conserval fan units and distribution ducting, a total energy saving package utilizing solar energy and stratified heat, found near the ceiling, will double or triple the total energy savings and replace the need for fuel burning air make up equipment. Fig. 6 shows a typical solar layout.

INDOOR AIR QUALITY

Proper ventilation is necessary to maintain a comfortable and healthy indoor environment. During the energy crunch, many people reduced their energy consumption by sealing buildings, making them air tight and then reducing ventilation air. They may have lowered their heating bill, but sometimes at the expense of indoor air quality. The "sick building syndrome" became an issue. One of the best ways of solving this problem according to ASHRAE, is to increase the volume of outside or ventilation air brought into a building. Of course, it requires energy to heat the air. The SOLARWALL® heater can do the job while reducing costs and improving air quality.

HIGHEST SOLAR EFFICIENCY

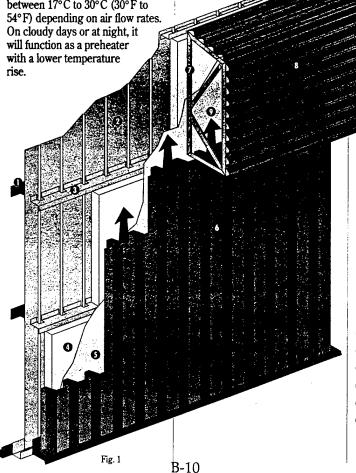
Independent laboratory tests conducted by the National Solar Test Facility and funded by the

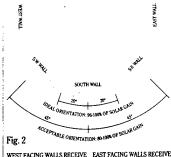
> Federal Government found the SOLARWALL® to be much more efficient than conventional, air type solar heaters.

SOLARWALL® cladding generates heat even on cloudy days. A small temperature rise of several degrees is useful energy when put to use for preheating outside air. Conven-

tional solar space heating systems only work on sunny days when the air temperature in the solar panel is above room temperature.

- Building Steel Girt
- 2 Interior Liner Sheet
- 3 Notched Z-bar Subgirt
- 4 Insulation
- **5** Exterior Liner Sheet
- 6 Perforated Solar Cladding
- 7 Canopy Frame
- 8 Canopy Cladding
- Heated Air to Fan Unit





WEST FACING WALLS RECEIVE 50% OF SOLAR GAIN, FROM 12:00 NOON TO SUNSET 50% OF SOLAR GAIN, FROM SUNRISE TO 12:00 NOON

SOLAR ORIENTATION

The ideal location for a SOLARWALL* heater is a south facing wall within 20 degrees east or west of south although any orientation between east and west is suitable. Fig. 2 shows the potential solar gain for various wall orientations. If a south facing wall is not available, then consider either, or both, east and west walls. The east wall would generate the most heat in the morning while the west in the afternoon.

The SOLARWALL* cladding will aid in summer cooling by preventing the normal solar heat gain from striking the main wall. Hot air will thermal syphon up the wall and out the top holes in the solar cladding leaving the main wall cool.

Wall mounting is preferred to roof mount systems due to considerably lower installation costs. A vertical solar panel will actually outperform a sloped panel during the heating season since sunlight striking the ground in front of a wall will be reflected into the wall panels. A layer of snow can reflect up to 70% additional solar radiation on to the wall, increasing system performance.

APPLICATIONS

The SOLARWALL® heater can be considered for every building which requires ventilation air or makeup air. The SOLARWALL® cladding heats outside air for use in a building.

If the volume of outside air required for ventilation is known at the building design stage, attempt to bring in as much of that air as possible through the SOLAR-WALL* cladding. If the air volume is not known, maximize the available sun facing wall area and rate the wall as a preheater for outside air flows of between 70 - 140 cubic metres per hour of air per square metre of SOLARWALL* cladding (4 - 8 cfm/ft²).

Ideal applications include:

- industrial buildings
- apartment building corridor ventilation
- commercial buildings with roof fans or penthouses
- hospitals and other institutional buildings
- · schools and gymnasiums
- government and military buildings
- · warehouses and airport hangars
- residential (new air tight homes)

Indoor air quality is a major issue and is best solved by bringing in as much outside air as possible especially if the fuel to heat it is free sunlight. Designing a wall which is a heater not only addresses the air quality issue but generates income for the owner in terms of fuel savings.

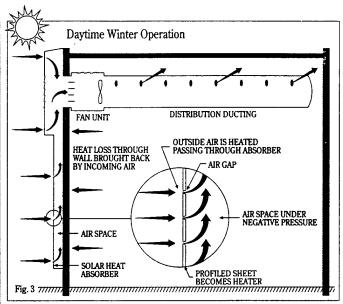
MATERIAL, PROFILES, COLOR

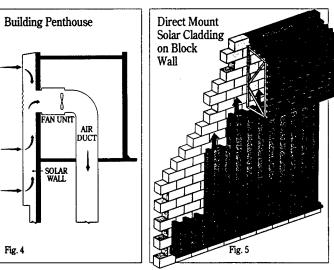
The SOLARWALL® cladding is similar to conventional wall cladding except for the millions of tiny openings, and heat absorbing surface. Fig. 7 shows a few of the various profiles available. Most conventional building profiles can be incorporated into a SOLARWALL® heating system.

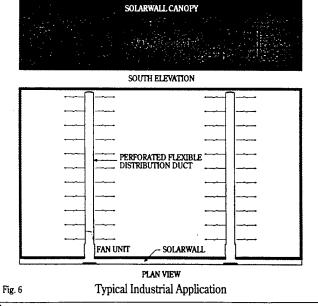
Aluminum is used in most SOLARWALL® applications for its superior corrosion resistance properties. The coating on the SOLARWALL® cladding is specially formulated for its solar absorption properties and resistance to ultraviolet degradation. It is a baked-on finish available in several dark colors ranging from black, dark brown, dark green, to dark blue. The darker the color, the greater amount of heat that is absorbed.

ADVANTAGES

- · free heating of outside air
- · maintenance free
- provides attractive, durable exterior wall
- · improves indoor air quality
- · effective day and night
- · very low capital cost
- 100% environmentally friendly
- virtually eliminates wall heat loss
- · summer cooling benefits
- corrects building negative air pressure situations
- recipient of ASHRAE energy award



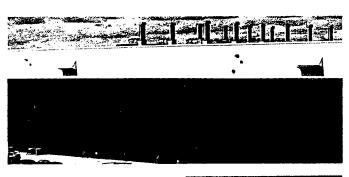




Typical Profiles 914 mm (36") COVERAGE 1. 914 mm (36") COVERAGE 2. 610 mm (24") COVERAGE 3.

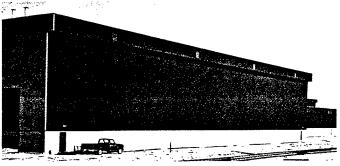
All measurements shown are approximate. Many other profiles are available, contact Conserval.

Fig. 7









SOLARWALL SYSTEMS are protected by patents 1,196,825, 1,283,333, 4,774,932, 4,899,728 and 4,934,338. Other patents pending. SOLARWALL is a registered trademark of Conserval Engineering Inc.

FOLTZ ENGINEERING

P.O. BOX 1107 ESTES PARK, CO 80517 (303) 586-8762 FAX 586-3598

SUGGESTED SPECIFICATION Section A SOLARWALL®

WORK INCLUDED:

SOLARWALL* system to be designed and supplied by Conserval Engineering Inc. of Downsview, Ontario or Conserval Systems Inc. of Buffalo, NY, including vertical wall cladding and horizontal canopy cladding, flashing and closures, summer bypass damper, and sub-framing to support wall cladding and canopy. Design must develop specified solar heat gain requirements, and provide optimum energy gain and flow to satisfy air intake needs.

HEATING CAPACITY: The SOLARWALL® cladding shall be designed to balance the air flow passing through it and the air shall then be ducted to the nearest intake fan. The air capacity of the total wall shall be m³/h $m^3/h/m^2$ cfm) or cfm/ft2) of SOLARWALL® area. Supplier shall state the heat capacity of the wall on a sunny day based on test results from a government approved independent laboratory for SOLARWALL® panels at comparable air flow rates.

MATERIALS: Exterior cladding to be nominal 0.80mm (0.032") thick perforated aluminum, standard building sheet alloy, painted solar dark color, in a profile (see fig. 7) to suit solar air flow. The perforated hole size and spacing to be based on solar need and air balancing requirements.

Flashing to be from same aluminum material, unperforated. Supply closures in locations where air infiltration is not desired.

Exposed fasteners to be self-tapping stainless steel sheet metal screws, color to match cladding, per Conserval's standards.

Sub-framing, including support clips, canopy framing, and subgirts to be manufactured from galvanized steel, minimum nominal thickness of 1.22mm (0.048").

For new installations, provide a flat, unsealed, galvanized sheet, or similar, to isolate insulation from SOLARWALL® air flow.

Summer bypass louvers to have dampers controlled by outdoor thermostat.

DESIGN: SOLARWALL* shall be designed to support positive and B-12

negative wind loads noted on the drawings at a deflection not exceeding 1/180th of the span. SOLARWALL* cladding profiles to be based on framing design: eg.

 a) 44.5mm (1.75") trapezoidal, to be used with profile running vertically and sub-framing providing required air space.

b) 76mm (3") and 102mm (4") deep rib, to be used with profile running vertically, sub-framing

may not be required.

INSTALLATION: Materials to be installed in accordance with the drawings and Conserval's standard installation procedures.

Confirm fastener holding strength prior to installation, especially when fastening to existing building walls.

Section B Conserval Fan

The air make-up unit shall be Conserval model #___, fully assembled, tested and complete with intake and return air modulating dampers and automatic discharge air temperature control, as supplied by Conserval Engineering Inc. of Downsview, Ontario or Conserval Systems Inc. of Buffalo, NY. The unit shall have a capacity m³/h (_ _cfm) at 187 PA (3/4") static pressure, complete with HP totally enclosed motor and bearings designed for continuous operation, Volts, Phase, Hz.

Warranty

There is a manufacturer's warranty against defects in material and workmanship for a period of one year.



Conserval Engineering Inc.

200 Wildcat Road Downsview, (Toronto) ON M3J 2N5 (416) 661-7057 Fax (416) 661-7146

Conserval Systems Inc.

2211 Main Street, Building B Buffalo, NY 14214 (716) 835-4903 Fax (716) 835-4904 SOLAR WALL EVALUATION

8030

FORT CARSON

BUILDING

Maintenance Shop

VENTILATION RATE	VENT	274,250	cfm '
WALL AREA	AREA	14,160	ft2
COLLECTOR EFFICIENCY	EFF	0%	
AIR HEAT CONTENT	CP	0.83	Btuh/F/cfm
DAYS PER WEEK	DAYS	7	
SYSTEM COST	FIRST	17.88	\$/ft2
ENERGY COST	COST	3.48	\$/MBTU
HEAT WHEEL EFFECTIVENESS	HWE	71%	
AVERAGE SOLAR TEMP RISE (24)	HRS)	0	
ROOM TEMPERATURE	ROOM	64	
BOILER EFFICIENCY	BOIL	70%	

ALL 7 HU UNITS.

COST = \$4.97/MILBIUH

		DAILY	BASE						
		SOUTH	65		-			VENT	
		WALL	DEGREE	AMBIENT	SOLAR	HEAT	GAS	HEATING	SOLAR
MONTH	DAYS	INSOL -	DAYS	TEMP	HEAT	WHEEL	HEAT	LOAD	FRACTION
		Btu/ft2	F-days	F	MBtu	MBtu	MBtu	MBtu	
JAN	31	1421	1,116	29	0	4,208	1,888	6,097	0%
FEB	28	1384	952	31	0	3,584	1,617	5,201	0%
MAR	31	1223	930	35	0	3,487	1,594	5,081	0%
APR	30	940	572	46	0	2,095	1,029	3,123	0%
MAY	31	696	302	56	0	962	687	1,649	0%
JUN	30	610	0	65	0	0	0	0	0%
JUL	31	647	0	71	0	0	0	0	0%
AUG	31	831	0	69	0	0	0	0	0%
SEP	30	1170	181	61	0	349	638	987	0%
oct	31	1438	470	50	0	1,683	886	2,569	0%
NOV	30	1379	810	38	0	3,025	1,400	4,426	0%
DEC	31	1227	1,054	31	0	3,968	1,790	5,758	0%
YR	365	1080.5	6,387		0	23,362	11,529	34,891	0%

ESTIMATED FIRST COST	<u>\$253,181</u>
ANNUAL ENERGY COST SAVINGS	\$0
SIMPLE PAYBACK (yrs)	#DIV/0!
ENERGY DISCOUNT FACTOR (1)	9.51
DISCOUNTED ENERGY COST SAVINGS	\$0
SIR	0.0
INTERNAL RATE OF RETURN	-100.00%

(1) Natural gas, 4% discount rate, 10 year life, Region 4.

JOB FT CARSON	
SHEET NO.	OF
CALCULATED BY	DATE 3-19-93
CHECKED BY	DATE

E M C ENGINEERS, INC.

Denver • Atlanta • Germany

FAN HP = CFM X (DP "H20)

6350 X 0.50

= 86.38 HP X 745 W/HPX 3.41 BOUH/W = 219,439 BOUH X 8,760 HAS/YP 1 EG = 1,9 ZZ MBOUH X 4.97 \$/WBOUH

APPENDIX C

LCCA, CALCULATIONS, AND BACKUP DATA, ECOs 13, 14, 16, AND 19

TAB C-1 FORT CARSON MOTOR STUDY ECO #13

	LOCATION: FORT	CARSON, COLO	ORADO	REGION:	4	PROJECT NO:	
		FT CARSON EEA			•		1000
			_			FISCAL YEAR:	1992
	DISCRETE PORTION		CO 13: Replace		-IP Motors with High E	-	
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	≣: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$2,770	
В.	SIOH COST		(5.5% of 1A) =			\$152	
C.	DESIGN COST		(6.0% of 1A) =			\$166	
D.	TOTAL COST		(1A + 1B + 1C) =			\$3,089	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EX	KISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$3,089
2 EN	IERGY SAVINGS (+) or	· COST (-)					
DA	TE OF NISTIR 85-3273-X	USED FOR DISCOU	NT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4	SAVINGS (5)	
A.	ELEC	\$7.32	24.57	\$180	14.53	, ,	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$94	13.59	\$1,278	
G.	TOTAL		24.57	\$274		>	\$3,893
3 NC	NENERGY SAVINGS ((+) or COST (-)					
Α.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59)	
	2 DISCOUNTED SAVING	GS or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		DISCOUNTED SVGS or COST (4)	
	a. 12 Standard 1/2 HP M	otors	\$2,434	5			
	b.		\$0	0	0.02	• •	
	c.		\$0	0	0.00	• -	
	d TOTAL		\$2,434	•	0.00	\$1,996	
C.	TOTAL NONENERGY DE	SCOUNTED SAVING			(3A2 + 3Bd4) =		\$1,996
					, = : == = ,		4.,000
4 SIN	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		7.8
5 TO	TAL NET DISCOUNTE	D SAVINGS			(2G5 + 3C) =	:	\$5,889
6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)			(5/1G) =		1.91
7 AD	JUSTED INTERNAL RA	ATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/20 power - 1] x 100 =		7.41

		CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME:	ECO 13: Replace	17 Standard 3/4 H	IP Motors with High E	fficiency Motors	
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
1 IN	ESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$4,140	
В.	SIOH COST		(5.5% of 1A) =			\$228	
C.	DESIGN COST		(6.0% of 1A) =			\$248	
D.	TOTAL COST		(1A + 1B + 1C) =			\$4,616	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$4,616
2 EN	ERGY SAVINGS (+) or	COST (-)					
DA	TE OF NISTIR 85-3273-X U	JSED FOR DISCO	JNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	20.22	\$148	14.53	\$2,152	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$88	13.59	\$1,193	
G.	TOTAL		20.22	\$236		>	\$3,345
3 NO	NENERGY SAVINGS (+	+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59	•	
	2 DISCOUNTED SAVING	S or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a. 17 Standard 3/4 HP Mo	otors	\$3,636	5	0.82	, ,	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$3,636			\$2,981	
C.	TOTAL NONENERGY DIS	COUNTED SAVIN	GS or COST		(3A2 + 3Bd4) =	, .,	\$2,981
4 SIM	IPLE PAYBACK (SPB) -	- (YRS)		1G/(2	:G3 + 3A + (3Bd1/20)) =		11.1
5 TO	TAL NET DISCOUNTED	SAVINGS		•	(2G5 + 3C) =		\$6,327
	/INGS-TO-INVESTMEN				(5/1G) =		1.37
7 AD	JUSTED INTERNAL RA	TE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to 1	/20 power - 1] x 100 =		5.65

	LOCATION: FORT	CARSON, COLO	ORADO	REGION:	4	PROJECT NO:	
		•		ricaioit.	7		
		T CARSON EEA				FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO 13: Replace		Motors with High Efficie	ency Motors	
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
4 1813	/ESTMENT COSTS						
	CONSTRUCTION COST		=			\$3,183	
В.			(5.5% of 1A) =			\$175	
	DESIGN COST		(6.0% of 1A) =			\$191	
	TOTAL COST		(1A + 1B + 1C) =			\$3,549	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
Ģ.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$3,549
2 EN	ERGY SAVINGS (+) or	COST (-)					
DA	TE OF NISTIR 85-3273-X U	ISED FOR DISCOL	INT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	11.20	\$82	14.53	\$1,192	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$45	13.59	\$616	
G.	TOTAL		11.20	\$127		>	\$1,808
0 NG	NENEROVOA (NOO.	`	•				
	NENERGY SAVINGS (-	+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVING	S or COST		$(3A \times 3A1) =$		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a. 8 Standard 1 HP Motor	s	\$2,464	5	0.82	\$2,020	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$2,464			\$2,020	
C.	TOTAL NONENERGY DIS	SCOUNTED SAVIN	GS or COST		(3A2 + 3Bd4) =		\$2,020
4 911	ADI E DAVRACK (CDD)	. (VPS)					
4 SIMPLE PAYBACK (SPB) - (YRS) 5 TOTAL NET DISCOUNTED SAVINGS				1G/(2G3 + 3A + (3Bd1/20)) =		14.2
					(2G5 + 3C) =		\$3,828
	VINGS-TO-INVESTMEN	, ,	///mm		(5/1G) =		1.08
/ AD	JUSTED INTERNAL RA	TE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/20 power - 1] x 100 =		4.39

	LOCATION: FORT	CARSON, COLO	DRADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	T CARSON EEA	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO 13: Replace	13 Standard 1-1/2	HP Motors with High		
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$5,338	
В.	SIOH COST		(5.5% of 1A) =			\$294	
C.	DESIGN COST		(6.0% of 1A) =			\$320	
D.	TOTAL COST		(1A + 1B + 1C) =			\$5,952	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$5,952
							•
2 EN	IERGY SAVINGS (+) or	COST (-)					
DA	TE OF NISTIR 85-3273-X U	ISED FOR DISCOL	INT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	25.54	\$187	14.53	\$2,718	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	(
F.	DEMAND SAVINGS	\$69.68 / year		\$105	13.59	\$1,420	
G.	TOTAL.		25.54	\$292		>	\$4,139
3 NC	NENEDOV SAVINGS (, ,) or COST ()					
	NENERGY SAVINGS (r) or COST (-)					
Α.	ANNUAL RECURRING			/F TIL 10	10.50	\$0	
	1 DISCOUNT FACTOR	00007		(From Table A-2) =	13.59		
	2 DISCOUNTED SAVING	S or COS I		$(3A \times 3A1) =$		\$C	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a.		\$4,070	5	0.82	\$3,337	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$4,070			\$3,337	
C.	TOTAL NONENERGY DIS	COUNTED SAVING	GS or COST		(3A2 + 3Bd4) =		\$3,337
4 SIN	MPLE PAYBACK (SPB) -	- (YRS)		16//2	2G3 + 3A + (3Bd1/20)) =		12.0
	TAL NET DISCOUNTED			. 4/(2	(2G5 + 3C) =		\$7,476
	6 SAVINGS-TO-INVESTMENT RATIO (SIR)				(5/1G) =		1.26
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%)			[(1+.04) x SIR to 1	/20 power - 1] x 100 =		5.19	

	LOCATION: FOR	T CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE		TIEGIOTI.	•		1000
				40.00		FISCAL YEAR:	1992
	DISCRETE PORTION		ECO 13: Replace		Motors with High Effic	·	
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST	r	=			\$4,276	
В.	SIOH COST		(5.5% of 1A) =			\$235	
C.	DESIGN COST		(6.0% of 1A) =			\$257	
D.	TOTAL COST		(1A + 1B + 1C) =			\$4,767	
Ε.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF E	XISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$4,767
2 EN	IERGY SAVINGS (+) o	r COST (-)					
DA	TE OF NISTIR 85-3273-X	USED FOR DISCO	UNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	29.99	\$220	14.53	\$3,192	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$91	13.59	\$1,241	
G.	TOTAL		29.99	\$311		>	\$4,432
3 NC	NENERGY SAVINGS	(+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVIN	IGS or COST		(3A x 3A1) =		\$0	
В	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$3,326	5	0.82	\$2,727	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$3,326	•	0.00	\$2,727	
C.	TOTAL NONENERGY D	ISCOUNTED SAVIN			(3A2 + 3Bd4) =	ΨΕ,7Ε7	\$2,727
					(4. 4		42,121
4 SII	MPLE PAYBACK (SPB)) - (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		10.0
5 TC	TAL NET DISCOUNTE	ED SAVINGS			(2G5 + 3C) =		\$7,160
6 SA	VINGS-TO-INVESTME	ENT RATIO (SIR)			(5/1G) =		1.50
	JUSTED INTERNAL F		N (AIRR) - (%)	[(1+.04) x SIR to	1/20 power - 1] x 100 =		6.14
					•		

		CARSON, COL		REGION:	4	PROJECT NO:	
	DISCRETE PORTION			. 40 04			1992
			:CO 13: Replace		Motors with High Effic		
	ANALYSIS DATE:	04/08/93	•	ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$4,454	
В.	SIOH COST		(5.5% of 1A) =			\$245	
C.	DESIGN COST		(6.0% of 1A) =			\$267	
D.	TOTAL COST		(1A + 1B + 1C) =			\$4,966	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EXI	STING EQUIP.	z			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$4,966
2 EN	IERGY SAVINGS (+) or (COST (J)					
	TE OF NISTIR 85-3273-X U	* *	NT FACTORS: C	OCTOBER 1002			
5,,	ENERGY	COST	SAVINGS		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)		DISCOUNT FACTOR (4)	DISCOUNTED	
Α.	ELEC	\$7.32	43.41	\$318	14.53	SAVINGS (5) \$4,620	
В.	DIST	4.102	0	•	17.63	\$4,620	
	NAT GAS	\$3.48	0	\$0	18.59	\$0 \$0	
	COAL	40	0	\$0	14.46	\$0 \$0	
	SOLAR		·	\$0	14.40	\$0	
	DEMAND SAVINGS	\$69.68 / year		\$143	13.59	\$1,941	
	TOTAL	, , , , , , , , , , , , , , , , , , ,	43.41	\$461	13.59	>	\$6,561
3 NC	MENEDOV SAVINOS (.) or COST ()					
	NENERGY SAVINGS (+) or COST (-)					
Α.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
_	2 DISCO INTED SAVING:	s or COS I		(3A x 3A1) ≈		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
	a 40 Ctandend 0 LID 14 4			OCCURRENCE (2)		SVGS or COST (4)	
	a. 10 Standard 3 HP Motor	rs	\$4,123	5	0.82	\$3,381	
	b.		\$0	0	0.00	\$0	*
	c. d TOTAL		\$0	0	0.00	\$0	
_		2011/1755	\$4,123			\$3,381	
C.	TOTAL NONENERGY DISC	COUNTED SAVING	is or COST		(3A2 + 3Bd4) =		\$3,381
4 SIN	MPLE PAYBACK (SPB) -	(YRS)		1G/(2	G3 + 3A + (3Bd1/20)) =		7.4
5 TO	TAL NET DISCOUNTED	SAVINGS			(2G5 + 3C) =		\$9,942
6 SA	VINGS-TO-INVESTMEN	T RATIO (SIR)		(5/1G) =			2.00
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%)				[(1+.04) x SIR to 1/20 power - 1] x 100 =			7.67

	LOCATION: FORT	CARSON, COLO	DRADO	REGION:	4	PROJECT NO:	
		T CARSON EEA			·	FISCAL YEAR:	1992
	DISCRETE PORTION			00 Ct	Makana wiki 18ab Etti		1992
			CO 13. Replace		Motors with High Effic	•	
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	:: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$13,580	
В.	SIOH COST		(5.5% of 1A) =			\$747	
	DESIGN COST		(6.0% of 1A) =		•	\$815	
	TOTAL COST		(1A + 1B + 1C) =			\$15,141	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$15,141
2 EN	IERGY SAVINGS (+) or	COST (-)					
DA	TE OF NISTIR 85-3273-X U	ISED FOR DISCOU	NT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
	ELEC	\$7.32	215.64	\$1,580	14.53	\$22,951	
	DIST		0	\$0	17.63	\$0	
	NAT GAS	\$3.48	0	\$0	18.59	\$0	
	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
	DEMAND SAVINGS	\$69.68 / year		\$611	13.59	\$8,305	
G.	TOTAL		215.64	\$2,191		>	\$31,256
- 114							
	ONENERGY SAVINGS (+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVING	S or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a. 29 Standard 5 HP Moto	ors	\$12,522	5	0.82	• • •	
	b.		\$0	0	0.00		
	c.		\$0	0	0.00	•	
	d TOTAL		\$12,522			\$10,268	
C.	TOTAL NONENERGY DIS	SCOUNTED SAVING			(3A2 + 3Bd4) =		\$10,268
					,		,
4 SII	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		5.4
5 TC	TAL NET DISCOUNTED	O SAVINGS			(2G5 + 3C) =		\$41,524
6 SA	VINGS-TO-INVESTMEN	NT RATIO (SIR)			(5/1G) =		2.74
7 AC	JUSTED INTERNAL RA	TE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/20 power - 1] x 100 =		9.38

							,
	LOCATION: FORT CARSON, COLORADO			REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO 13: Replace	13 Standard 7-1/2	HP Motors with High		
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	_	PREPARED BY:	A NIEMEVED
	ATTE OIL DATE.	04/00/55		LOCIVOIVIO LII L	. 20	FREFARED BT.	A. NICIVIC FER
4 151	\ (FOT)						
	VESTMENT COSTS						
	CONSTRUCTION COST		=			\$8,147	
	SIOH COST DESIGN COST		(5.5% of 1A) =			\$448	
	TOTAL COST		(6.0% of 1A) =			\$489	
	SALVAGE VALUE		(1A + 1B + 1C) =			\$9,083	
	SALVAGE VALUE OF EX	(ISTING FOLID	=			\$0	
	TOTAL INVESTMENT	donina Edoir.	= = (1D - 1E - 1F) =			\$0	\$0.000
۵.	TOTAL INVESTMENT		(10 - 15 - 11) =			>	\$9,083
	(EDO) (0 1) (1) (0 1)						
	NERGY SAVINGS (+) or	• • •					
DA	TE OF NISTIR 85-3273-X U						
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
۸	SOURCE ELEC	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
	DIST	\$7.32	107.68	\$789	14.53	\$11,461	
	NAT GAS	\$3.48	0	\$0 \$0	17.63	\$0	
	COAL	φ3.46	0	\$0 \$0	18.59 14.46	\$0 \$0	
	SOLAR		· ·	\$0 \$0	14.40	\$0 \$0	
	DEMAND SAVINGS	\$69.68 / year		\$339	13.59	\$4,612	•
	TOTAL	, , , c	107.68	\$1,128	10.00	φ τ ,υι 2	\$16,072
				41,125			Ψ10,07 <i>2</i>
3 NC	ONENERGY SAVINGS (I) or COST ()					
	ANNUAL RECURRING	+) 01 0031 (-)				**	
Λ.	1 DISCOUNT FACTOR			(From Table A-2) =	13.59	\$0	
	2 DISCOUNTED SAVING	SS or COST		(3A x 3A1) =	13.39	\$0	
				(0/1/2 0/1/) =		ΨΟ	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a. 13 Standard 7-1/2 HP I	Motors		5	0.82	\$5,957	
	b.		\$0	0	0.00	\$0	
	C.		\$0	0	0.00	\$0	
C	d TOTAL TOTAL NONENERGY DIS	SCOLINITED SAVING	\$7,265		(0.4.0 0.0.4.1)	\$5,957	AF 057
O.	TOTAL NONENERGY DIS	SCOUNTED SAVING	35 of COS1		(3A2 + 3Bd4) =		\$5,957
4 SIN	MPLE PAYBACK (SPB)	- (YRS)		1G//2	G3 + 3A + (3Bd1/20)) =		6.1
5 TOTAL NET DISCOUNTED SAVINGS				/2			
	VINGS-TO-INVESTMEN				(2G5 + 3C) =		\$22,029
		, ,	(AIDD) (0()	*** *** ***	(5/1G) =		2.43
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%)				[(1+.04) x SIH to 1	/20 power - 1] x 100 =		8.71

	LOCATION: FOR	TCARSON COL		REGION:			BBO IEST NO.	
		T CARSON, COL		REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA					FISCAL YEAR:	1992
	DISCRETE PORTIO		:CO 13: Replace	13 Standard 10 F				
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	Ξ: 20		PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS							
	CONSTRUCTION COST	F	. =				\$9,078	
	SIOH COST		= (5.5% of 1A) =				\$9,078 \$499	
	DESIGN COST		(6.0% of 1A) =				\$545	
	TOTAL COST		(1A + 1B + 1C) =				\$10,122	
	SALVAGE VALUE		=				\$0,122	
	SALVAGE VALUE OF E	XISTING FOUIP	_				\$0	
	TOTAL INVESTMENT	Suotina Edon .	(1D - 1E - 1F) =				φ υ <	\$10,122
			(.5 .2, -					Ψ10,122
2 EN	IERGY SAVINGS (+) o	or COST (-)						
DA	TE OF NISTIR 85-3273-X	USED FOR DISCOL	INT FACTORS: 0	CTOBER 1992				
	ENERGY	COST	SAVINGS	ANNUAL \$;	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)		FACTOR (4)	SAVINGS (5)	
Α.	ELEC	\$7.32	99.66	\$730		14.53	\$10,607	
В.	DIST		0	\$0		17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0		18.59	\$0	
D.	COAL		0	\$0		14.46	\$0	
E.	SOLAR			\$0			\$0	
	DEMAND SAVINGS	\$69.68 / year		\$367		13.59	\$4,981	
G.	TOTAL		99.66	\$1,097			>	\$15,588
3 NC	NENERGY SAVINGS	(+) or COST (-)						
	ANNUAL RECURRING	(., 555. ()					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =		13.59	ΨΟ	
	2 DISCOUNTED SAVIN			$(3A \times 3A1) =$		10.00	\$0	
				(0/1 / 0/11) =			ΨΟ	
В.	NONRECURRING							
	ITEM		SAVINGS or	YEAR OF		DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)		FACTOR (3)	SVGS or COST (4)	
	a. 13 Standard 10 HP M	lotors	\$7,799	5		0.82	\$6,395	
	b.		\$0	0		0.00	\$0	
	С.		\$0	0		0.00	\$0	
_	d TOTAL		\$7,799				\$6,395	
C.	TOTAL NONENERGY D	ISCOUNTED SAVIN	GS or COST		(3.4	(2 + 3Bd4) =		\$6,395
4 SII	MPLE PAYBACK (SPB) - (YRS)		10/	(2G3 + 3A + (3Bd1/20\\ -		6.8
	TAL NET DISCOUNTE	, , ,		14/		2G5 + 3C) =		\$21,983
	VINGS-TO-INVESTME				`	(5/1G) =		2.17
	JUSTED INTERNAL P		(AIRR) - (%)	[(1+.04) x SIR to	1/20 power -			8.11

PROJECT TITLE: FT CARSON EEAP UPDATE DISCRETE PORTION NAME: ECO 13: Replace 2 Standard 15 HP Motors with High Efficiency Motors ANALYSIS DATE: 04/08/93 ECONOMIC LIFE: 20 PREPARED BY: A. NIEMEYER 1 INVESTMENT COSTS A. CONSTRUCTION COST = \$1,958 B. SIGH COST (6.5% of 1A) = \$108 C. DESIGN COST (6.5% of 1A) = \$118 D. TOTAL COST (1A+1B+1C) = \$2,164 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (10-1E-1P) = \$0 C. DESIGN COST (10-1E-1P) = \$0 C. DATE OF NISTIR 83-3273 USED FOR DISCOUNT FACTORS: COTOBER 1992 ENERGY SALVINGS (1) or COST (2) DATE OF NISTIR 83-3273 USED FOR DISCOUNT FACTORS: COTOBER 1992 ENERGY COST SANIBUR (1) METIUM (2) SAIVINGS (3) FACTOR (4) SAIVINGS (5) ENERGY SALVINGS (10-1E-1P) = \$0 C. NATGAS \$3.48 0 \$0 \$17.83 \$2,850 B. DIST 0 \$0 C. NATGAS \$3.48 0 \$0 \$17.83 \$0 C. NATGAS \$3.48 0 \$0 \$17.83 \$0 C. NATGAS \$3.48 0 \$0 \$17.83 \$0 C. NATGAS \$3.48 0 \$0 \$18.59 \$0 S. DIST \$0 C. NATGAS \$3.48 0 \$0 \$18.59 \$0 S. DIST \$0 C. NATGAS \$3.48 0 \$0 \$0 \$18.59 \$0 C. NATGAS \$3.48 0		LOCATION: FORT	CARSON, COLO	DRADO	REGION:	4	PROJECT NO:	
DISCRETE PORTION NAME: ECO 13: Replace 2 Standard 15 HP Motors with High Efficiency Motors ANALYSIS DATE: 04/08/93 ECONOMIC LIFE: 20 PREPARED BY: A. NIEMEYER 1 INVESTMENT COSTS A. CONSTRUCTION COST						•		1000
ANALYSIS DATE: 04/08/93 ECONOMIC LIFE: 20 PREPARED BY: A, NIEMEYER								1992
INVESTMENT COSTS				CO 13: Replace				
A. CONSTRUCTION COST (5.5% of 1A) = \$1,958 B. SIOH COST (5.5% of 1A) = \$108 C. DESIGN COST (6.0% of 1A) = \$118 D. TOTAL COST (1A + 1B + 1C) = \$2,184 E. SALVAGE VALUE = \$50 G. TOTAL NOYED FEXISTING EQUIP. = \$50 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$2,184 2 ENERGY SAVINGS (+) or COST () DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY SAVINGS (*) or COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED SOURCE SMBTU (1) MBTUYR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) B. DIST \$0.50 \$10.50 \$17.83 \$2.950 B. DIST \$1.00 \$0.00 \$17.83 \$2.950 B. DIST \$1.00 \$0.00 \$17.83 \$0.00 C. NAT GAS \$3.48 \$0.0 \$0.00 \$17.83 \$0.00 C. NAT GAS \$3.48 \$0.0 \$0.0 \$17.83 \$0.00 C. NAT GAS \$3.48 \$0.0 \$0.0 \$1.8.59 \$0.00 C. D. COAL \$0.0 \$0.0 \$14.46 \$0.0 E. SOLAR \$0.0 \$0.0 \$1.46 \$0.0 F. DEMAND SAVINGS \$69.68 / year \$26.78 \$279 \$13.59 \$11,127 G. TOTAL \$26.78 \$279 \$13.59 \$1,127 3 NONENERGY SAVINGS (*) or COST (·) A. ANNUAL RECURRING \$0.0 \$0.0 \$0.0 \$0.0 B. NONECURRING [TEM COST (·) COCURRENCE (2) FACTOR (3) \$VQS or COST (4) \$1.324 b. \$0.0 \$0.0 \$0.0 \$0.0 \$0.0 \$0.0 \$0.0 \$0		ANALYSIS DATE:	04/08/93		ECONOMIC LIFE:	: 20	PREPARED BY:	A. NIEMEYER
B. SIOH COST (5.5% of IA) = \$108 C. DESIGN COST (6.0% of IA) = \$118 D. TOTAL COST (1A + 1B + 1C) = \$2,184 E. SALVAGE VALUE	1 IN	VESTMENT COSTS						
B. SIGH COST (5.5% of 1A) = \$108 C. DESIGN COST (6.0% of 1A) = \$118 C. DESIGN COST (6.0% of 1A) = \$118 D. TOTAL COST (1A + 18 + 1C) = \$2,184 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE \$0 F. SALVAGE VALUE \$0 G. TOTAL INVESTMENT (1D · 1E · 1F) = \$0 SQ G. TOTAL INVESTMENT (1D · 1E · 1F) = \$0 SQ G. TOTAL INVESTMENT (1D · 1E · 1F) = \$0 SQ DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED SOURCE SMBTU (1) MBTUYR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) SQURCE SMBTU (1) MBTUYR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) B. DIST 0 \$0 \$0 11.63 \$2.850 B. DIST 0 \$0 \$0 11.63 \$50 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 14.46 \$0 E. SOLAR \$0 \$0 14.46 \$0 E. SOLAR \$0 \$0 14.46 \$0 E. SOLAR \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 11.59 SQ \$1,127 G. TOTAL \$6.70 \$50 \$1.59 \$1.00 \$0 \$1.59 \$1.00 \$0 \$0 \$0 \$0 D. COAL \$0 \$0 \$0 \$0 \$0 \$0 D. COAL \$0 \$0 \$0 \$0 D. COAL \$0 \$0 \$0 \$0 \$0 D. COAL \$0 \$0 \$0 \$0 \$0 D. COAL \$0 \$0 \$0 \$0 D. COAL \$0 \$0 \$0 \$	A.	CONSTRUCTION COST		=			\$1,958	
D. TOTAL COST (1A+1B+1C) = \$2,184 E. SALVAGE VALUE = \$50 F. SALVAGE VALUE OF EXISTING EQUIP. = \$50 G. TOTAL INVESTMENT (1D-1E-1F) = \$50 DATE OF NISTIN 83-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL DISCOUNT DISCOUNTED SOURCE SMBTU (1) MBTU/NR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$50 17.63 \$50 C. NAT GAS \$3.48 0 \$50 18.59 \$50 D. COAL 0 \$50 17.63 \$50 D. COAL 0 \$50 14.46 \$50 E. SOLAR \$50 14.46 \$50 F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$11,127 G. TOTAL 26.78 \$279 \$3,977 3 NONENERGY SAVINGS (4) or COST (7) A. ANNUAL RECURRING \$50 TIEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED SOURCE SURGER (7) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$50 0 0 0.00 \$50 d TOTAL \$1,614 5 0.82 \$1,324 c. TOTAL \$1,614 5 0.82 \$1,324 c. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2+3B4d) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 16/(2G3+3A) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (SIR) = \$2,43	В.	SIOH COST		(5.5% of 1A) =				
E. SALVAGE VALUE	C.	DESIGN COST		(6.0% of 1A) =			\$118	
F. SALVAGE VALUE OF EXISTING EQUIP.	D.	TOTAL COST		(1A + 1B + 1C) =			\$2,184	
G. TOTAL INVESTMENT (ID - IE - IF) = \$2,184 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY SOURCE \$MBTU (1) MBTU/R (2) \$ANNUAL \$ DISCOUNT DISCOUNTED SAVINGS (5) SOURCE \$MBTU (1) MBTU/R (2) \$AVINGS (3) FACTOR (4) \$AVINGS (5) A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$0 17.63 \$0 C. NAT GAS \$3.48 0 \$0 18.59 \$0 D. COAL 0 \$0 14.46 \$0 E. SOLAR \$0 \$0 14.46 \$0 E. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$1,127 G. TOTAL 26.78 \$279 \$0 \$3,977 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 \$0 1 DISCOUNT FACTOR (From Table A-2) = 13.59 \$0 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 \$0 B. NONRECURRING (COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors	E.	SALVAGE VALUE		=			\$0	
2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL\$ DISCOUNT DISCOUNTED SOURCE SMBTU (1) MBTU/R (2) SAVINGS (3) FACTOR (4) SAVINGS (5) A ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$50 17.63 \$0 C. NAT GAS \$3.48 0 \$50 18.59 \$0 D. COAL 0 \$0 \$14.46 \$0 E. SOLAR \$0 \$50 \$1.127 G. TOTAL 26.78 \$279 \$11.127 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$59.68 / year 26.78 \$279 \$13.59 \$1,1127 3 DISCOUNT FACTOR (From Table A-2) = 13.59 \$0 B. NONRECURRING 1 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 E. SOLAR \$0 \$0 \$0 \$0 \$0 \$0 E. SOLOR \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	F.	SALVAGE VALUE OF EXI	ISTING EQUIP.	=			\$0	
DATE OF NISTIR 85-3279-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED SOURCE \$MBTU (1) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$0 \$0 17.63 \$0 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 F. DEMAND SAVINGS \$69.68 / year \$83 \$13.59 \$1,127 G. TOTAL 26.78 \$279 \$0 \$3.977 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 \$0 I DISCOUNT FACTOR \$0 \$0 \$0 B. NORRECURRING \$1 \$0 \$0 \$0 E. SOLAR \$0 \$0 \$0 \$0 I DISCOUNTED SAVINGS or COST \$0 \$0 \$0 E. SOLAR \$0 \$0 \$0 \$0 I DISCOUNTED SAVINGS (-) or COST (-) A. ANNUAL RECURRING \$0 \$0 \$0 \$0 I DISCOUNTED SAVINGS or COST \$0 \$0 \$0 \$0 COST (1) CCCURRENCE (2) FACTOR (3) \$VGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 \$5 \$0.82 \$1,324 \$0 b. \$0 \$0 \$0 \$0 \$0.00 \$0 c. \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$5 \$0.82 \$1,324 \$0 c. \$0 \$0 \$0 \$0 \$0.00 \$0 d TOTAL \$1,614 \$0.00 \$0	G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$2,184
DATE OF NISTIR 85-3279-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED SOURCE \$MBTU (1) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$0 \$0 17.63 \$0 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$1.127 G. TOTAL 26.78 \$279 \$11.127 G. TOTAL 26.78 \$279 \$13.59 \$1,127 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 \$0 \$13.59 \$0 TIEM \$AVINGS or YEAR OF DISCOUNT DISCOUNTED SAVINGS (1) OCCURRENCE (2) FACTOR (3) \$VGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 \$0 b. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$5 0.82 \$1,324 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$0 \$0 S1,324 \$1,324 \$0 d SIMPLE PAYBACK (SPB) - (YRS) \$1,324 \$0 d SIMPLE PAYBACK (SPB) - (YRS) \$1,324 \$0 d SAVINGS-TO-INVESTMENT RATIO (SIR) \$1,324	2 EN	IEDGY SAVINGS (1) or	COST ()					
ENERGY COST SAVINGS ANNUAL\$ DISCOUNTED SOURCE \$AMBTU (1) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (6) A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 0 \$0 17.63 \$0 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 \$0 14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 C. TOTAL RECURRING (From Table A-2) = 13.59 \$1,127 COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A x 3A + (3Bd1/20)) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$1,614 C. SAVINGS OR COST (265 3A) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/14) = 2.43		, ,	• • • • • • • • • • • • • • • • • • • •	NT EACTORS.	OTORER 1000			
SOURCE \$MBTU (1) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$0 \$0 17.63 \$0 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 \$14.46 \$0 E. SOLAR \$0 \$0 \$0 14.46 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$1,127 G. TOTAL 26.78 \$279 \$	υ Α					DISCOUNT	DISCOUNTED	
A. ELEC \$7.32 26.78 \$196 14.53 \$2,850 B. DIST 0 \$0 17.63 \$0 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 14.46 \$0 E. SOLAR \$0 \$0 \$0 14.46 \$0 F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$1,127 G. TOTAL 26.78 \$279 \$0 \$3,977 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING (From Table A-2) = 13.59 2 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING (GAX 3A1) = \$0 B. NONRECURRING (SAVINGS or COST (-) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3B44) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NONESTMENT RATIO (SIR) (5/1G) = 2.43								
B. DIST 0 \$0 \$0 17.63 \$0 0 C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 0 0 COAL 0 \$0 \$0 14.46 \$0 0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 \$0 E. SOLAR \$0 \$0 \$0 \$14.46 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0 \$0	Α.				. ,	` '	• • • • • • • • • • • • • • • • • • • •	
C. NAT GAS \$3.48 0 \$0 \$0 18.59 \$0 D. COAL 0 \$0 14.46 \$0 E. SOLAR \$0 \$0 \$0 F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$11,127 G. TOTAL 26.78 \$279 \$3,977 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 \$0 1 DISCOUNT FACTOR \$ (From Table A-2) = 13.59 2 DISCOUNTED SAVINGS or COST \$ (3A x 3A1) = \$0 B. NONRECURRING \$ SOVINGS or YEAR OF DISCOUNT DISCOUNTED \$ COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 \$5 0.82 \$1,324 b. \$0 \$0 \$0 0.00 \$0 c. \$0 \$0 0 0.00 \$0 c. \$0 \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST \$ (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$16/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS \$ (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) \$50 \$0.00 \$			Ψ		•		• •	
D. COAL 0 \$0 14.46 \$0 E. SOLAR \$0 \$0 \$0 F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$1,127 G. TOTAL 26.78 \$279 \$			\$3.48		•		·	
E. SOLAR F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$1,127 G. TOTAL 26.78 \$279 \$3,977 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING 1 DISCOUNT FACTOR (From Table A-2) = 13.59 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3B44) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$16/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR)	D.	COAL	*****		-		·	
F. DEMAND SAVINGS \$69.68 / year \$83 13.59 \$1,127 G. TOTAL 26.78 \$279	E.	SOLAR		_	•		•	
G. TOTAL 26.78 \$279	F.	DEMAND SAVINGS	\$69.68 / year			13.59		
A. ANNUAL RECURRING 1 DISCOUNT FACTOR 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614	G.	TOTAL	•	26.78	\$279		·	\$3,977
A. ANNUAL RECURRING 1 DISCOUNT FACTOR 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614	3 NC	NENERGY SAVINGS (A) or COST (A)					
1 DISCOUNT FACTOR 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) \$50			, a. 0001 (-)				¢0	
2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0 0.00 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$1,324 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) \$5,301	Λ.				(From Table A-2) -	13 50	φυ	
B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43			S or COST		•	13.39	\$0	
ITEM	R		0 0, 000 1		(0// / 0//) =		ΨΟ	
COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) \$1(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43	٥.			SAVINGS or	VEAR OF	DISCOLINT	DISCOLINTED	
a. 2 Standard 15 HP Motors \$1,614 5 0.82 \$1,324 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43		· · - · · ·						
b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43		a. 2 Standard 15 HP Moto	rs	• •	• •	• •	• • •	
c. \$0 0 0.00 \$0 d TOTAL \$1,614 \$1,614 \$1,324 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43							•	
d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) 7 AD MORTHLY DISCOUNTED AND A SAME AND A		c.						
C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$1,324 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) = 6.1 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43		d TOTAL			_	3.33		
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43	C.	TOTAL NONENERGY DIS	COUNTED SAVING	S or COST		(3A2 + 3Bd4) =	, , ,	\$1,324
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$5,301 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43	1 CIN	ADI E DAVBACK (SDB)	(VDC)			100 0A (CT 100)		• .
6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.43					1G/(2			
				(AIRR) - (%)	[(1± 04) × SID +> 1			8.72

	LOCATION: FOR	RT CARSON, COI	OBADO	REGION:	4	PROJECT NO:	
				REGION:	4		
	PROJECT TITLE:	FT CARSON EE				FISCAL YEAR:	1992
	DISCRETE PORTIC		ECO 13: Replace	2 Standard 20 HF	Motors with High Effic	ciency Motors	
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	:: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COS	ST	=			\$2,369	
В.	SIOH COST		(5.5% of 1A) =			\$130	
C.	DESIGN COST	•	(6.0% of 1A) =			\$142	
D.	TOTAL COST		(1A + 1B + 1C) =			\$2,642	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF		=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$2,642
2 EN	IERGY SAVINGS (+)	or COST (-)					
DA	TE OF NISTIR 85-3273-	X USED FOR DISCO	OUNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	17.25	\$126	14.53	\$1,836	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$85	13.59	\$1,155	
G.	TOTAL		17.25	\$211		>	\$2,991
3 NC	DNENERGY SAVING	S (+) or COST (-)					
A.	ANNUAL RECURRING	à				\$0	
	1 DISCOUNT FACTO	R		(From Table A-2) =	13.59		
	2 DISCOUNTED SAV	INGS or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)		SVGS or COST (4)	
	a. 2 Standard 20 HP M	Motors	\$1,986	5	0.82	, , , , ,	
	b.		\$0	0	0.00	\$0	
*	c.		\$0	0	0.00	\$0	
	d TOTAL		\$1,986		·	\$1,628	
C.	TOTAL NONENERGY	DISCOUNTED SAVI	NGS or COST		(3A2 + 3Bd4) =		\$1,628
4 SII	MPLE PAYBACK (SP	B) - (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		8.5
5 TC	TAL NET DISCOUNT	TED SAVINGS			(2G5 + 3C) =		\$4,620
6 SA	VINGS-TO-INVESTM	MENT RATIO (SIR)			(5/1G) =		1.75
7 AC	JUSTED INTERNAL	RATE OF RETUR	N (AIRR) - (%)	[(1+.04) x SIR to	6.95		

	LOCATION: FORT	CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE: F	T CARSON EE	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	ECO 13: Replace	4 Standard 25 HP	Motors with High Effic	ciency Motors	
	ANALYSIS DATE:	04/08/93	·	ECONOMIC LIFE	-	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$6,083	
В.	SIOH COST		(5.5% of 1A) =			\$335	
C.	DESIGN COST		(6.0% of 1A) =			\$365	
D.	TOTAL COST		(1A + 1B + 1C) =			\$6,783	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EXI	STING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$6,783
2 EN	IERGY SAVINGS (+) or (COST (-)					
DA	TE OF NISTIR 85-3273-X U	SED FOR DISCOL	JNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)		
A.	ELEC	\$7.32	61.54	\$451	14.53	, ,	
В.	DIST		0	\$0	17.63	· ·	
C.	NAT GAS	\$3.48	0	\$0	18.59	• •	
D.	COAL		0	\$0	14.46	\$0	
Ε.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$191	13.59	\$2,595	
G.	TOTAL		61.54	\$642		>	\$9,144
3 NC	NENERGY SAVINGS (+	-) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVINGS	S or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)		SVGS or COST (4)	
	a. 4 Standard 25 HP Motor	rs	\$4,818	5	0.82	\$3,951	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$4,818			\$3,951	
C.	TOTAL NONENERGY DIS	COUNTED SAVING	GS or COST		(3A2 + 3Bd4) =	,	\$3,951
					,		•
4 SIN	MPLE PAYBACK (SPB) -	(YRS)		1G/(2	G3 + 3A + (3Bd1/20)) =		7.7
5 TO	TAL NET DISCOUNTED	SAVINGS			(2G5 + 3C) =		\$13,095
6 SA	VINGS-TO-INVESTMEN	T RATIO (SIR)		(5/1G) =			1.93
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%)				[(1+.04) x SIR to 1/20 power - 1] x 100 =			7.48

LOCATION: FORT CARSON, COLORADO REGION: 4 PROJECT	NO:
DISCRETE PORTION NAME: ECO 13: Replace 2 Standard 30 HP Motors with High Efficiency Motors	S
ANALYSIS DATE: 04/08/93 ECONOMIC LIFE: 20 PREPARE	D BY: A. NIEMEYER
1 INVESTMENT COSTS	•
	3,577
	\$197
(5.5.7)	\$215
D. TOTAL COST (1A + 1B + 1C) = E. SALVAGE VALUE =	3,989
F. SALVAGE VALUE OF EXISTING EQUIP.	\$0 \$0
	\$0
G. TOTAL INVESTMENT (1D - 1E - 1F) =	> \$3,989
2 ENERGY SAVINGS (+) or COST (-)	
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	
ENERGY COST SAVINGS ANNUAL\$ DISCOUNT DISCO	JNTED
	IGS (5)
4 5 5	3,409
B. DIST 0 \$0 17.63	\$0
C. NAT GAS \$3.48 0 \$0 18.59	\$0
D. COAL 0 \$0 14,46	\$0
E. SOLAR \$0	\$0
F. DEMAND SAVINGS \$69.68 / year \$100 13.59	61,354
G TOTAL 20.00 #004	\$4,763
A NONENEROY ON WINDS () COST ()	
3 NONENERGY SAVINGS (+) or COST (-)	
A. ANNUAL RECURRING	\$ 0
1 DISCOUNT FACTOR (From Table A-2) = 13.59	
2 DISCOUNTED SAVINGS or COST (3A x 3A1) =	\$0
B. NONRECURRING	
ITEM SAVINGS or YEAR OF DISCOUNT DISCO	INTED
COST (1) OCCURRENCE (2) FACTOR (3) SVGS or CO	ST (4)
a. \$2,812 5 0.82	2,306
b. \$0 0 0.00	\$0
c. \$0 0 0.00	\$0
	2,306
C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) =	\$2,306
4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/20)) =	0.4
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) =	8.4 \$7,069
6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) =	1.77
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%) [(1+.04) x SIR to 1/20 power - 1] x 100 =	7.02

		CARSON, COLO		REGION:	4	PROJECT NO:	
		T CARSON EEA					1992
	DISCRETE PORTION I		CO 13: Replace		Motors with High Effic	•	•
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
Α.	CONSTRUCTION COST		=			\$13,934	
В.	SIOH COST		(5.5% of 1A) =			\$766	
C.	DESIGN COST		(6.0% of 1A) =			\$836	
D.	TOTAL COST		(1A + 1B + 1C) =			\$15,536	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EXIS	STING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$15,536·
2 EN	IERGY SAVINGS (+) or (COST (-)					
DA	TE OF NISTIR 85-3273-X U	SED FOR DISCOL	INT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	130.40	\$955	14.53	\$13,879	
В.	DIST		0	\$0	17.63	\$0	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	1
	DEMAND SAVINGS	\$69.68 / year		\$406	13.59	\$5,511	
G.	TOTAL		130.40	\$1,361		>	\$19,390
3 NC	NENERGY SAVINGS (+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVINGS	S or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a. 6 Standard 40 HP Motor	rs	\$11,095	5	0.82	\$9,098	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
_	d TOTAL		\$11,095			\$9,098	
C.	TOTAL NONENERGY DISC	COUNTED SAVING	GS or COST		(3A2 + 3Bd4) =		\$9,098
4 SIN	MPLE PAYBACK (SPB) -	(YRS)		1G/(2	:G3 + 3A + (3Bd1/20)) =		8.1
5 TO	TAL NET DISCOUNTED	SAVINGS		·	(2G5 + 3C) =		\$28,488
6 SA	VINGS-TO-INVESTMEN	T RATIO (SIR)			(5/1G) =		1.83
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%)				[(1+.04) x SIR to 1	/20 power - 1] x 100 =		7.20

	LOCATION: FOR	T CARSON, CO	LORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE			,		1000
				444.00		FISCAL YEAR:	1992
	DISCRETE PORTIO		ECO 13: Replace		tors (1/2 to 40 HP) with	n High Efficiency M	lotors
	ANALYSIS DATE:	04/08/93		ECONOMIC LIFE	:: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS					•	
A.	CONSTRUCTION COST	т	=			\$82,886	
В.	SIOH COST		(5.5% of 1A) =			\$4,559	
C.	DESIGN COST		(6.0% of 1A) =			\$4,973	
D.	TOTAL COST		(1A + 1B + 1C) =			\$92,418	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF E	XISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =		•	>	\$92,418
2 EN	ERGY SAVINGS (+) o	or COST (-)					
	TE OF NISTIR 85-3273-X		UNT FACTORS: C	OCTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)		
A.	ELEC	\$7.32	845.91	\$6,196	• • •	٠,	
В.	DIST		0	\$0	17.63	•	
C.	NAT GAS	\$3.48	0	\$0	18.59	\$0	
D.	COAL		0	\$0	14.46	• -	
E.	SOLAR		,	\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year	(39.4 KW)	\$2,747	13.59	\$37,338	
G.	TOTAL	•	845.91	\$8,944		>	\$127,370
							•
3 NC	NENERGY SAVINGS	(+) or COST (-)					
	ANNUAL RECURRING	()				\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59	Ψ0	
	2 DISCOUNTED SAVIN			$(3A \times 3A1) =$	10.00	\$0	
				(OA X OAT) =		ΨΟ	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a. 141 Standard Motors	(1/2 to 40 HP)	\$69,964	5	0.82	\$57,370	
	b.		\$0	0	0.00	\$0	
	C		\$0	0	0.00	\$0	
_	d TOTAL		\$69,964			\$57,370	
C.	TOTAL NONENERGY D	ISCOUNTED SAVI	NGS or COST		(3A2 + 3Bd4) =		\$57,370
4 SIN	MPLE PAYBACK (SPB) - (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		7.4
5 TO	TAL NET DISCOUNTE	ED SAVINGS			(2G5 + 3C) =		\$184,740
6 SA	VINGS-TO-INVESTME	ENT RATIO (SIR)			(5/1 G) =		2.00
7 AD	JUSTED INTERNAL F	RATE OF RETUR	N (AIRR) - (%)	[(1+.04) x SIR to	1/20 power - 1] x 100 =		7.66

CONSTRUCTION COST ESTIMA	TE		DATE PREPAR				
Project				06-Apr-93	BASIS FOR ES	SHEET 1	OF 3
UPDATE EXISTING EEAP					באסוס ו סוו בי	711MA1E	
Location FORT CARSON, COLORADO					X	Code A (No de Code B (Prelin	sign completed
Architect-Engineer					_	Code C (Final	design)
E M C ENGINEERS, INC., 2750 S. W./ Drawing No.	ADSWORTH	BLVD., D		27	Checked by	Other (Specify)
		1	MEYER		T. FORSTER	l	
ECO #13 High Efficiency Motors	Quant No.	tity Unit	Labor Per		Mate Per	rial	Total
(Remove existing motor, install new)	Units	Meas.	Unit	Total	Unit	Total	Cost
0.5 HP Motor	12	EA	41.91	502.92	118.80	1425.60	\$1,928.52
Overhead, Bond, Ins. (16.8%)							\$323.99
Workers Comp. Ins. (7.3%)							\$36.71
Profit (10%)							\$228.92
Contingency (10%)							\$251.82
TOTAL							\$2,769.97
0.75 HP Motor	17	EA	41.91	712.47	127.80	2172.60	\$2,885.07
Overhead, Bond, Ins. (16.8%)							\$484.69
Workers Comp. Ins. (7.3%)							\$52.01
Profit (10%)							\$342.18
Contingency (10%)							\$376.40
TOTAL							\$4,140.35
1 HP Motor	8	EA	41.91	335.28	237.00	1896.00	T
Overhead, Bond, Ins. (16.8%)							\$374.86
Workers Comp. Ins. (7.3%)							\$24
Profit (10%)							\$263
Contingency (10%)							\$289.37
TOTAL							\$3,183.04
1.5 HP Motor	13	EA	41.91	544.83	246.00	3198.00	\$3,742.83
Overhead, Bond, Ins. (16.8%)							\$628.80
Workers Comp. Ins. (7.3%)							\$39.77
Profit (10%)							\$441.14
Contingency (10%)							\$485.25
TOTAL				•			\$5,337.80
2 HP Motor	10	EA	41.91	419.10	258.00	2580.00	\$2,999.10
Overhead, Bond, Ins. (16.8%)							\$503.85
Workers Comp. Ins. (7.3%)							\$30.59
Profit (10%)							\$353.35
Contingency (10%)							\$388.69
TOTAL							\$4,275.59
3 HP Motor	10	EA	41.91	419.10	270.60	2706.00	\$3,125.10
Overhead, Bond, Ins. (16.8%)					Ò		\$525.02
Workers Comp. Ins. (7.3%)							\$30.59
Profit (10%)							\$368.07
Contingency (10%)							\$404.88
TOTAL						•	\$4,45:
ENG FORM 150			PREVIOUS EDITION MAY	BE USED	*U.S. GC	VERNMENT PRINTING	OFFICE 1959 0-516148

ONSTRUCTION COST ESTIMAT	E		DATE PREPARE	D 06-Apr-93	SHEET 2 OF 3		
roject				00 Apr 00	BASIS FOR ES		
UPDATE EXISTING EEAP					X	Code A (No desig	n completed)
FORT CARSON, COLORADO						Code B (Prelimina	ary design)
rchitect-Engineer EMCENGINEERS, INC., 2750 S. WA	DSWORTH	BLVD D	ENVER. CO 8022	7		Code C (Final des Other (Specify)	sign)
rawing No.		Estimate	or		Checked by		
ECO #13	Quant		MEYER Labor		T. FORSTER Mater		
High Efficiency Motors Remove existing motor, install new)	No. Units	Unit Meas.	Per Unit	Total	Per Unit	Total	Total Cost
5 HP Motor	29	EA	41.91	1215.40	286.80	8317.20	\$9,532.60
Overhead, Bond, Ins. (16.8%)							\$1,601.48
Workers Comp. Ins. (7.3%)							\$88.72
Profit (10%)							\$1,122.28
Contingency (10%)							\$1,234.51
TOTAL				····			\$13,579.58
7.5 HP Motor	13	EA	49.70	646.12	390.60	5077.80	\$5,723.92
Overhead, Bond, Ins. (16.8%)							\$961.62
Workers Comp. Ins. (7.3%)							\$47.17
Profit (10%)	,						\$673.27
Contingency (10%)							\$740.60
TOTAL							\$8,146.57
10 HP Motor	13	EA	51.66	671.64	439.20	5709.60	\$6,381.24
Overhead, Bond, Ins. (16.8%)							\$1,072.05
Workers Comp. Ins. (7.3%)							\$49.03
Profit (10%)							\$750.23
Contingency (10%)							\$825.25
TOTAL							\$9,077.80
15 HP Motor	2	EA	62.00	123.99	627.00	1254.00	\$1,377 .99
Overhead, Bond, Ins. (16.8%)							\$231.50
Workers Comp. Ins. (7.3%)	-						\$9.05
Profit (10%)							\$161.85
Contingency (10%)							\$178.04
TOTAL							\$1,958.44
20 HP Motor	2	EA	73.92	147.84	759.60	1519.20	\$1,667.04
Overhead, Bond, Ins. (16.8%)							\$280.06
Workers Comp. Ins. (7.3%)							\$10.79
Profit (10%)							\$195.79
Contingency (10%)							\$215.37
TOTAL							\$2,369.06
25 HP Motor	4	EA	76.46	305.85	994.80	3979.20	\$4,285.05
Overhead, Bond, ins. (16.8%)							\$719.89
Workers Comp. Ins. (7.3%)							\$22.33
Profit (10%)							\$502.73
Contingency (10%)							\$553.00
TOTAL							\$6,083.00
						T	

CONSTRUCTION COST ESTIMA	TE		DATE PREPAR				
Project				06-Apr-93	BASIS FOR ES		OF 3
UPDATE EXISTING EEAP							
Location FORT CARSON, COLORADO					X	Code A (No de: Code B (Prelim	sign completed
Architect-Engineer	DOWODTU	BLVD D	EW/ED 00 00	207		Code C (Final c	lesign)
E M C ENGINEERS, INC., 2750 S. WA	DSWORIN	Estimate		221	Checked by	Other (Specify)	
ECO #13			MEYER		T. FORSTER		r
High Efficiency Motors	Quant No.	Unit	Labo Per	r	Mate:	rial	Total
(Remove existing motor, install new)	Units	Meas.	Unit	Total	Unit	Total	Cost
30 HP Motor	2	EA	79.21	158.42	1181.40	2362.80	\$2,521.22
Overhead, Bond, Ins. (16.8%)							\$423.57
Workers Comp. Ins. (7.3%)							\$11.56
Profit (10%)							\$295.64
Contingency (10%)			-				\$325.20
TOTAL							\$3,577.19
40 HP Motor	6	EA	93.00	557.98	1544.40	9266.40	\$9,824.38
Overhead, Bond, Ins. (16.8%)							\$1,650.50
Workers Comp. Ins. (7.3%)							\$40.73
Profit (10%)							\$1,151.56
Contingency (10%)							\$1,266.72
TOTAL							\$13,933.88
GRAND TOTAL							\$82,885.93
				- 1			

		·					
-						ą	
					,,		•
THO FORM 450							
ENG FORM 150 1 AUG 59			PREVIOUS EDITION MAY	BE USED	*U.S. GO\	ERNMENT PRINTING O	FFICE 1959 0-516148

P-8142 MAL-7	LII		MOTOR APPLICATION	MOTOR SIZE (HP)	PART. LOAD FACTOR (0.00)	MOT EFFICIE EXISTING	NCY	HOURS OF OPERATION (HRS/YR)	ELECTRICAL DEMAND REDUCTION (kW)	ANNU ELECTR ENERGY S (kWh/YR)	ICAL
P-8000		P-8142	MAU-7								2.51
P-8000 PRVI-5 0.5 0.75 0.800 0.790 4130 0.11 483 1.1						0.600	0.790	4130		463	1.58
P-8000			PRV1-5			0.600	0.790		0.11		1.58
P.8142 MAU-5 0.5 0.75 0.800 0.790 4130 0.11 463 1.1		P-8000	EF2-3		0.75	0.600	0.790	4130	0.11	463	1.58
P-8000 PRV7-3 0.5 0.75 0.600 0.790 4130 0.11 483 1.1 P-8142 MAU-3 0.5 0.75 0.800 0.799 6570 0.11 737 2.1 P-8000 PRV4-4 0.5 0.75 0.800 0.790 4130 0.11 463 1.3 P-8000 PRV4-3 0.5 0.75 0.800 0.790 4130 0.11 463 1.3 P-8000 PRV4-3 0.5 0.75 0.800 0.790 6570 0.11 737 724 P-8002 EF-1 0.5 0.75 0.750 0.800 0.790 6570 0.11 463 1.1 P-8002 EF-1 0.5 0.75 0.750 0.720 0.825 6570 0.07 487 1.1 P-8142 UH-1B 0.75 0.75 0.75 0.720 0.825 6570 0.07 487 1.1 P-8142 <th< th=""><th></th><th>P-8142</th><th>MAU-8</th><th>0.5</th><th>0.75</th><th>0.600</th><th>0.790</th><th>6570</th><th>0.11</th><th>737</th><th>2.51</th></th<>		P-8142	MAU-8	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
P-8142 MAU-3 0.5 0.75 0.800 0.790 6570 0.11 737 2.2		P-8142		0.5	0.75	0.600	0.790	6570	0.11	737	2.51
P-8142 MAU-3 0.5 0.75 0.600 0.790 6570 0.11 737 2.2				0.5	0.75	0.600	0.790	4130	0.11	463	1.58
P-8000		P-8142	MAU-3		0.75	0.600	0.790	6570	0.11	737	2.51
P-8000		P-8142	MAU-4	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
P-8000								ļ		463	1.58
P-8030 EF-1 0.5 0.75 0.800 0.790 8570 0.11 737 224 244					İ	0.600		4130		463	1.58
P-2352				}					0.11	737	2.51 24.57
P-2352		D 0140	LIL 10	. 0.75	0.75	0.720	0.835	6570	0.07	197	1.66
P-8142					İ						1.67
P-8000			•								
P-8142											1.05
P-8142											
P-8142		_				1					1.66
P-8000											1.66
P-8000 EF1-3 0.75 0.75 0.720 0.825 4130 0.07 306 1.16											1.05
P-8000											1.05
P-8000 PRV6-2 0.75 0.75 0.720 0.825 4130 0.07 306 11.0 P-8000 PRV4-1 0.75 0.75 0.720 0.825 4130 0.07 306 11.0 P-8000 EF1-2 0.75 0.75 0.720 0.825 4130 0.07 306 11.0 P-8000 PRV4-3 0.75 0.75 0.720 0.825 4130 0.07 306 11.0 P-8000 AC 21-1 0.75 0.75 0.720 0.825 1640 0.07 306 11.0 P-8000 HV8-1 0.75 0.75 0.720 0.825 4130 0.07 306 11.0 P-8000 HV6-3 0.75 0.75 0.720 0.825 4130 0.07 306 11.0 P-8000 HV6-3 0.75 0.75 0.760 0.855 8760 0.08 538 11.0 P-8000 EF 21-3 1.0 0.75											0.42
P-8000						i					1.05
P-8000 EF1-2 0.75 0.75 0.720 0.825 4130 0.07 306 1.0											1.05
P-8000											1.05
P-8000 AC 21-1 0.75 0.75 0.720 0.825 1640 0.07 122 0.0 P-8000 HV8-1 0.75 0.75 0.720 0.825 4130 0.07 306 1.1 P-8000 HV6-3 0.75 0.75 0.720 0.825 4130 0.07 306 1.1 P-8000 HV6-3 0.75 0.75 0.760 0.855 6577 0.08 538 1. P-8000 EF 21-3 1.0 0.75 0.760 0.855 8760 0.08 717 2. P-8000 EF2-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1A 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF2-2 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 PRV6-1 1.0 0.75					İ			!			1.05
P-8000 HV8-1 0.75 0.75 0.720 0.825 4130 0.07 306 1.1 P-8000 HV6-3 0.75 0.75 0.720 0.825 4130 0.07 306 1.1 P-8000 HV4-1A 1.0 0.75 0.760 0.855 8760 0.08 717 2. P-8000 EF2-1 1.0 0.75 0.760 0.855 8760 0.08 717 2. P-8000 EF2-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1A 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF2-2 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 PRV6-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1B 1.0 0.75 0.760				ŀ							0.42
P-8000					1						1.05
P-2350 Hot Water Pump 1.0 0.75 0.760 0.855 6577 0.08 538 1.0 0.75 0.760 0.855 8760 0.08 717 2.0 0.08 EF 21-3 1.0 0.75 0.760 0.855 8760 0.08 717 2.0 0.08 0.855 8760 0.08 717 2.0 0.08 0.855 8760 0.08 717 2.0 0.08 0.855 8760 0.08 338 1.0 0.08 338 1.0 0.08 0.08 338 1.0 0.08 0.08 0.08 0.08 0.08 0.08 0.08				1							1.05
P-8000 EF 21-3 1.0 0.75 0.760 0.855 8760 0.08 717 2.0 P-8000 EF2-1 1.0 0.75 0.760 0.855 4130 0.08 338 1.0 P-8000 HV4-1A 1.0 0.75 0.760 0.855 4130 0.08 338 1.0 P-8000 EF2-2 1.0 0.75 0.760 0.855 4130 0.08 338 1.0 P-8000 PRV6-1 1.0 0.75 0.760 0.855 4130 0.08 338 1.0 P-8000 EF7-4 1.0 0.75 0.760 0.855 4130 0.08 338 1.0 P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 1.1 P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2.0 P-2350 Chilled Water Pump 1.5						325	0.020				20.22
P-8000 EF2-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1A 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF2-2 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 PRV6-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF7-4 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-2160 Hot Water Pump 1.5 0.75 0.760 0.855 4130 0.08 338 1. P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0		P-2350	Hot Water Pump	1.0	0.75	0.760	0.855	6577	0.08	538	1.84
P-8000 HV4-1A 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF2-2 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 PRV6-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF7-4 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-2160 Hot Water Pump 1.5 0.75 0.760 0.855 4130 0.08 338 1. P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5		P-8000	EF 21-3	1.0	0.75	0.760	0.855	8760	0.08	717	2.45
P-8000 EF2-2 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 PRV6-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF7-4 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2. P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5		P-8000	EF2-1	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
P-8000 PRV6-1 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 EF7-4 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2. P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-8000	HV4-1A	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
P-8000 EF7-4 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 1. P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2. P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-8000	EF2-2	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
P-8000 HV4-1B 1.0 0.75 0.760 0.855 4130 0.08 338 338 3281.50 1.1 P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2. P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-8000	PRV6-1	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
P-2160 Hot Water Pump 1.5 0.75 0.775 0.860 6577 0.11 704 2. P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-8000	EF7-4	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-8000	HV4-1B	1.0	0.75	0.760	0.855	4130		1	1.15 11.20
P-2060 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-2160	Hot Water Pump	1.5	0.75	0.775	0.860	6577	0.11	704	2.40
P-2350 Chilled Water Pump 1.5 0.75 0.775 0.860 2183 0.11 234 0. P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-2060	1		i		1				0.80
P-1953 CW / HW Pump 1.5 1.00 0.775 0.860 8029 0.14 1146 3. P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.		P-2350	Chilled Water Pump				ļ				0.80
P-8142 RF-1 1.5 0.75 0.775 0.860 6570 0.11 703 2.			CW / HW Pump								3.91
			1			ļ					2.40
, , , , , , , , , ,,,,			Chilled Water Pump								0.80

BLDG NO.	MOTOR APPLICATION	MOTOR SIZE (HP)	PART. LOAD FACTOR (0.00)	MOT EFFICIE EXISTING		HOURS OF OPERATION (HRS/YR)	ELECTRICAL DEMAND REDUCTION (kW)	ANNU ELECTR ENERGY S (kWh/YR)	ICAL
P-2052	CW / HW Pump	1.5	1.00	0.775	0.860	8029	0.14	1146	3.9
P-2160	Chilled Water Pump	1.5	0.75	0.775	0.860	2183	0.11	234	0.8
P-2074	CW / HW Pump	1.5	1.00	0.775	0.860	5744	0.14	820	2.
P-8000	HV7-2	1.5	0.75	0.775	0.860	4130	0.11	442	1.5
P-8142	MAU-6	1.5	0.75	0.775	0.860	6570	0.11	703	2.4
P-8000	HV6-1	1.5	0.75	0.775	0.860	4130	0.11	442	1.5
P-8000	HV6-2	1.5	0.75	0.775	0.860	4130	0.11 1.50	442 7482.37	1.5 25. 5
P-8000	EF4-1	2.0	0.75	0.790	0.865	4130	0.12	507	1.
P-8142	UH-3B	2.0	0.75	0.790	0.865	6570	0.12	807	2.
P-2071	CW / HW Pump	2.0	1.00	0.790	0.865	7947	0.16	1301	4.
P-8142	UH-3D	2.0	0.75	0.790	0.865	6570	0.12	807	2.
P-2070	CW / HW Pump	2.0	1.00	0.790	0.865	6475	0.16	1060	3.
P-8142	UH-3C	2.0	0.75	0.790	0.865	6570	0.12	807	2.
P-8000	PRV21-2	2.0	0.75	0.790	0.865	8760	0.12	1076	3.
P-8142	UH-3E	2.0	0.75	0.790	0.865	6570	0.12	807	2
P-8142	UH-3F	2.0	0.75	0.790	0.865	6570	0.12	807	2
P-8142	UH-3A	2.0	0.75	0.790	0.865	6570	0.12 1.31	807 8786.04	2 29
P-2700	Chilled Water Pump	3.0	0.75	0.810	0.890	2183	0.19	407	1
P-2153	CW / HW Pump	3.0	1.00	0.810	0.890	7206	0.25	1790	6
P-8030	EF-19A	3.0	0.75	0.810	0.890	4380	0.19	816	2
P-2700	Air Handling Unit	3.0	0.75	0.810	0.890	8760	0.19	1632	5
P-2700	Hot Water Pump	3.0	0.75	0.810	0.890	6577	0.19	1225	4
P-1950	CW / HW Pump	3.0	1.00	0.810	0.890	8029	0.25	1994	ε
P-2452	CW / HW Pump	3.0	1.00	0.810	0.890	8240	0.25	2046	6
P-8030	EF-19B	3.0	0.75	0.810	0.890	4380	0.19	816	2
P-8142	RF-?	3.0	0.75	0.810	0.890	6570	0.19	1224	4
P-8000	HV9-1	3.0	0.75	0.810	0.890	4130	0.19 2.05	769 12718.32	2 43
P-8000	PRV1-4	5.0	0.75	0.830	0.896	4130	0.25	1025	3
P-2073	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9
P-2054	CW / HW Pump (Est.)	5.0	1.00	0.830	0.896	7216	0.33	2389	8
P-2051	CW / HW Pump	5.0	1.00	0.830	0.896	7206	0.33	2385	8
P-1954	CW / HW Pump	5.0	1.00	0.830	0.896	7206	0.33	2385	8
P-2150	CW / HW Pump	5.0	1.00	0.830	0.896	6696	0.33	2217	. 7
P-8000	PRV3-3	5.0	0.75	0.830	0.896	4130	0.25	1025	3
P-8000	PRV2-1	5.0	0.75	0.830	0.896	4130	0.25	1025	3
P-8000	AHU 21-3	5.0	0.75	0.830	0.896	8760	0.25	2175	7
P-8000	PRV1-3	5.0	0.75	0.830	0.896	4130	0.25	1025	3
P-8000	EF1-4	5.0	0.75	0.830	0.896	4130	0.25	1025	3
P-2060	Hot Water Pump	5.0	0.75	0.830	0.896	6577	0.25	1633	5
P-1951	CW / HW Pump	5.0	1.00	0.830	0.896	7947	0.33	2631	8
P-1952	CW / HW Pump	5.0	1.00	0.830	0.896	8029	0.33	2658	9
P-2450	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9
P-2451	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9

LINE BLDG NO. NO.	MOTOR APPLICATION	(a) (a) (a) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	PART. LOAD FACTOR	MOT EFFICIE	NCY	HOURS OF OPERATION	DEMAND REDUCTION	ANNUA ELECTRI ENERGY S	CAL AVINGS
		(HP)	(0.00)	EXISTING	NEW	(HRS/YR)	(kW)	(kWh/YR)	(MBTU)
P-8000	AHU 21-1	5.0	0.75	0.830	0.896	8760	0.25	2175	7.42
P-2251	CW / HW Pump	5.0	1.00	0.830	0.896	7509	0.33	2486	8.48
P-2252	CW / HW Pump	5.0	1.00	0.830	0.896	6284	0.33	2080	7.10
P-2253	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
P-2151	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
P-2050	CW / HW Pump	5.0	1.00	0.830	0.896	8029	0.33	2658	9.07
P-1853	Hot Water Pump	5.0	0.75	0.830	0.896	6577	0.25	1633	5.57
P-2453	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9.31
P-2254	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
P-2152	CW / HW Pump	5.0	1.00	0.830	0.896	7947	0.33	2631	8.98
P-2454	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9.31
P-8000	HV7-1	5.0	0.75	0.830	0.896	4130	0.25	1025	3,50
P-2072	CW / HW Pump	5.0	1.00	0.830	0.896	7206	0.33 8.77	2385 63182.11	8.14 215.6 4
P-8142	HV-1	7.5	0.75	0.845	0.914	6570	0.37	2463	8.41
P-8000	AHU 21-2	7.5	0.75	0.845	0.914	8760	0.37	3284	11.21
P-8030	HVU-1	7.5	0.75	0.845	0.914	6570	0.37	2463	8.41
P-8000	PRV3-2	7.5	0.75	0.845	0.914	4130	0.37	1548	5.28
P-8000	RTV-1" MUA	7.5	0.75	0.845	0.914	4130	0.37	1548	5.28
P-8142	MZU-1	7.5	0.75	0.845	0.914	6570	0.37	2463	8.4
P-8000	RF21-1	7.5	0.75	0.845	0.914	8760	0.37	3284	11.2
P-8000	PRV1-6	7.5	0.75	0.845	0.914	4130	0.37	1548	5.2
P-8000	RF21-2	7.5	0.75	0.845	0.914	8760	0.37	3284	11.2
P-8000	RT-2 MUA	7.5	0.75	0.845	0.914	4130	0.37	1548	5.2
P-8000	EF1-1	7.5	0.75	0.845	0.914	4130	0.37	1548	5.2
P-2160	Air Handling Unit	7.5	0.75	0.845	0.914	8760	0.37	3284	11.2
P-2060	Air Handling Unit	7.5	0.75	0.845	0.914	8760	0.37	3384	11.2
1 -2000	Air Handing Offic	7.5	0.75	0.043	0.314	0700	4.87	31551.01	107.6
P-2352	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.0
P-8000	RT-1F MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-1853	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.0
P-8000	RT-1C MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-2350	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.0
P-8000	RT-1B MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-8000	RT-1E MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-8000	RT-1D MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-8000	RT-3A MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-2700	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.0
P-8000	RT-3C MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-8000	RT-3B MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.7
P-8000	RT-1A MUA	10.0	0.75	0.860	0.917	4130	0.40 5.26	1670 29201.46	5.7 99 .6
P-8030	EF-2	15.0	0.75	0.867	0.924	6570	0.60	3923	13.3
P-8030	HV-2	15.0						3923	13.3 26.7
P-8000	RT-4B MUA	20.0	0.75		0.930	4130	0.61	2527	8.6

LINE NO.	BLDG NO.	MOTOR APPLICATION	MOTOR SIZE	PART. LOAD FACTOR	MOT EFFICIE		HOURS OF OPERATION	ELECTRICAL DEMAND REDUCTION	ANNU. ELECTRI ENERGY S.	CAL
			(HP)	(0.00)	EXISTING	NEW	(HRS/YR)	(kW)	(kWh/YR)	(MBTU)
	P-8000	RT-4A MUA	20.0	0.75	0.885	0.930	4130	0.61 1.22	2527 5053.55	8.62 17.25
	P-8030	EF-4A	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
	P-8030	HV-4A	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
	P-8030	EF-3	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
	P-8030	HV-3	25.0	0.75	0.894	0.935	6570	0.69 2.74	4508 18030.19	15.38 61.54
	P-8030	HV-4B	30.0	0.75	0.902	0.938	6570	0.71	4692	16.01
	P-8030	EF-4B	30.0	0.75	0.902	0.938	6570	0.71 1.43	4692 9384.47	16.01 32.03
	P-8030	EF-5	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
	P-8030	HV-5	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
	P-8030	EF-7	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
	P-8030	HV-6	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
	P-8030	EF-6	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
	P-8030	HV-7	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
								5.82	38206.61	130.40

PROJECT: LOCATION: UPDATE EXISTING EEAP STUDY

FORT CARSON, COLORADO

PHASE:

PREPARED BY: A. NIEMEYER

INTERIM

CLIENT PROJECT ENC R.W. WHITE

CLIENT PROJECT NO: EMC PROJECT NO:

DATE:

2102-001 07-Apr-93

Page 1 of 5

2 3 4 5	P-1853 P-1853 P-1853 P-1853 P-1853 P-1950	APPLICATION Air Handling Unit Air Handling Unit Hot Water Pump Hot Water Pump	SIZE (HP) 10.0 5.0 5.0	(0.00) 0.75 0.75	EFFICIE EXISTING 0.860	NEW	OPERATION (HRS/YR)	REDUCTION (kW)	ENERGY S (kWh/YR)	(MBTU)
2 3 4 5	P-1853 P-1853 P-1853 P-1853	Air Handling Unit Hot Water Pump Hot Water Pump	5.0		0.860	007				
3 4 5	P-1853 P-1853 P-1853	Hot Water Pump Hot Water Pump		0.75		0.917	8760	0.40	3543	12.09
4 5	P-1853 P-1853	Hot Water Pump	5.0		0.830	0.896	NOT USED			
5	P-1853	•		0.75	0.830	0.896	6577	0.25	1633	5.57
			0.5	0.75	0.600	0.790	NOT USED			
اما	P-1950	Chilled Water Pump	1.0	0.75	HIGH E	FFICIENCY	MOTOR			
6		CW / HW Pump	3.0	1.00	0.810	0.890	8029	0.25	1994	6.81
7	P-1951	CW / HW Pump	5.0	1.00	0.830	0.896	7947	0.33	2631	8.98
8	P-1952	CW / HW Pump	5.0	1.00	0.830	0.896	8029	0.33	2658	9.07
9	P-1953	CW / HW Pump	1.5	1.00	0.775	0.860	8029	0.14	1146	3.91
10	P-1954	CW / HW Pump	5.0	1.00	0.830	0.896	7206	0.33	2385	8.14
11	P-2050	CW / HW Pump	5.0	1.00	0.830	.0.896	8029	0.33	2658	9.07
12	P-2051	CW / HW Pump	5.0	1.00	0.830	0.896	7206	0.33	2385	8.14
13	P-2052	CW / HW Pump	1.5	1.00	0.775	0.860	8029	0.14	1146	3.91
14	P-2054	CW / HW Pump (Est.)	5.0	1.00	0.830	0.896	7216	0.33	2389	8.15
15	P-2060	Air Handling Unit	7.5	0.75	0.845	0.914	8760	0.37	3284	11.21
16	P-2060	Air Handling Unit	5.0	0.75	0.830	0.896	NOT USED			
17	P-2060	Hot Water Pump	5.0	0.75	0.830	0.896	6577	0.25	1633	5.57
18	P-2060	Hot Water Pump	0.33	0.75	0.580	0.680	NOT USED			
19	P-2060	Chilled Water Pump	1.5	0.75	0.775	0.860	2183	0.11	234	0.80
20	P-2070	CW / HW Pump	2.0	1.00	0.790	0.865	6475	0.16	1060	3.62
21	P-2071	CW / HW Pump	2.0	1.00	0.790	0.865	7947	0.16	1301	4.44
22	P-2072	CW / HW Pump	5.0	1.00	0.830	0.896	7206	0.33	2385	8.14
23	P-2073	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
24	P-2074	CW / HW Pump	1.5	1.00	0.775	0.860	5744	0.14	820	2.80
25	P-2150	CW / HW Pump	5.0	1.00	0.830	0.896	6696	0.33	2217	7.57
26	P-2151	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
27	P-2152	CW / HW Pump	5.0	1.00	0.830	0.896	7947	0.33	2631	8.98
28	P-2153	CW / HW Pump	3.0	1.00	0.810	0.890	7206	0.25	1790	6.11
29	P-2154	CW / HW Pump	5.0	1.00	HIGH E	FFICIENCY	MOTOR			
	P-2160	Air Handling Unit	7.5	0.75	0.845	0.914	8760	0.37	3284	11.21
1	P-2160	Air Handling Unit	3.0	0.75	0.810	0.890	NOT USED			
32	P-2160	Hot Water Pump	1.5	0.75	0.775	0.860	6577	0.11	704	2.40
	P-2160	Hot Water Pump	1.0	0.75	0.760	0.855	NOT USED			
	P-2160	Chilled Water Pump	1.5	0.75	0.775	0.860	2183	0.11	234	0.80
35	P-2251	CW / HW Pump	5.0	1.00	0.830	0.896	7509	0.33	2486	8.48
	P-2252	CW / HW Pump	5.0	1.00	0.830	0.896	6284	0.33	2080	7.10
37	P-2253	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
	P-2254	CW / HW Pump	5.0	1.00	0.830	0.896	8760	0.33	2900	9.90
39									-	
40		SUBTOTAL			C1-2	23		8.19	62308.0	212.66

PROJECT: LOCATION: UPDATE EXISTING EEAP STUDY

FORT CARSON, COLORADO

PHASE: INTERIM PREPARED BY: A. NIEMEYER CLIENT PROJECT ENC R.W. WHITE

CLIENT PROJECT NO:

EMC PROJECT NO:

2102-001 DATE: 07-Apr-93

LINE NO:	BLDG NO.	MOTOR APPLICATION	MOTOR SIZE	PART. LOAD FACTOR	MOT EFFICIE		HOURS OF OPERATION	ELECTRICAL DEMAND REDUCTION	ANNU ELECTR ENERGY S	IICAL
NO.	NO:	AFFLICATION	(HP)		EXISTING	NEW	(HRS/YR)	(kW)	(kWh/YR)	(MBTU)
1	P-2350	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.09
2	P-2350	Hot Water Pump	1.0	0.75	0.760	0.855	6577	0.08	538	1.84
3	P-2350	Chilled Water Pump	1.5	0.75	0.775	0.860	2183	0.11	234	0.80
4	P-2352	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.09
5	P-2352	Hot Water Pump	0.75	0.75	0.720	0.825	6577	0.07	488	1.67
6	P-2352	Chilled Water Pump	1.5	0.75	0.775	0.860	2183	0.11	234	0.80
7	P-2450	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9.31
8	P-2451	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9.31
9	P-2452	CW / HW Pump	3.0	1.00	0.810	0.890	8240	0.25	2046	6.98
10	P-2453	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9.31
11	P-2454	CW / HW Pump	5.0	1.00	0.830	0.896	8240	0.33	2728	9.31
12	P-2700	Air Handling Unit	10.0	0.75	0.860	0.917	8760	0.40	3543	12.09
13	P-2700	Air Handling Unit	3.0	0.75	0.810	0.890	8760	0.19	1632	5.57
14	P-2700	Hot Water Pump	3.0	0.75	0.810	0.890	6577	0.19	1225	4.18
15	P-2700	Chilled Water Pump	3.0	0.75	0.810	0.890	2183	0.19	407	1.39
16	P-8000	RTV-1 MUA	7.5	0.75	0.845	0.914	4130	0.37	1548	5.28
17	. P-8000	RT-1A MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5
18	P-8000	RT-1B MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
19	P-8000	RT-1C MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
20	P-8000	RT-1D MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
21	P-8000	RT-1E MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
22	P-8000	RT-1F MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
23	P-8000	RT-2 MUA	7.5	0.75	0.845	0.914	4130	0.37	1548	5.2%
24	P-8000	RT-3A MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
25	P-8000	RT-3B MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
26	P-8000	RT-3C MUA	10.0	0.75	0.860	0.917	4130	0.40	1670	5.70
27	P-8000	RT-4A MUA	20.0	0.75	0.885	0.930	4130	0.61	2527	8.62
28	P-8000	RT-4B MUA	20.0	0.75	0.885	0.930	4130	0.61	2527	8.62
29	P-8000	EF1-1	7.5	0.75	0.845	0.914	4130	0.37	1548	5.28
30	P-8000	PRV1-3	5.0	0.75	0.830	0.896	4130	0.25	1025	3.50
31	P-8000	PRV1-4	5.0	0.75	0.830	0.896	4130	0.25	1025	3.50
32	P-8000	PRV1-5	0.5	0.75	0.600	0.790	4130	0.11	463	1.58
33	P-8000	PRV1-6	7.5	0.75	0.845	0.914	4130	0.37	1548	5.28
34	P-8000	EF1-2	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
35	P-8000	EF1-3	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
36	P-8000	PRV2-1	5.0	0.75	0.830	0.896	4130	0.25	1025	3.50
37	P-8000	EF2-1	1.0	0.75	0.760	0.855	4130	0.08	338	1
38	P-8000	PRV3-2	7.5	0.75	0.845	0.914	4130	0.37	1548	5.28
39	P-8000	EF1-4	5.0	0.75	0.830	0.896	4130	0.25	1025	3.50
40		SUBTOTAL			771 7			11.79	61,682.9	210.52

PROJECT: LOCATION:

PHASE:

UPDATE EXISTING EEAP STUDY

FORT CARSON, COLORADO

INTERIM PREPARED BY: A. NIEMEYER CLIENT PROJECT ENG R.W. WHITE

CLIENT PROJECT NO:

EMC PROJECT NO: DATE:

2102-001 07-Apr-93

Page 3 of 5

		A. NIEWETEN			DATE:		07-Apr-93		Page 3 of 5	
LII		MOTOR APPLICATION	MOTOR SIZE	PART. LOAD FACTOR	MOT EFFICIE	ENCY	OF OPERATION	ELECTRICAL DEMAND REDUCTION	ANNL ELECTF ENERGY S	RICAL SAVINGS
	1 P-8000	EF2-2	(HP) 1.0	(0,0) 0.75	EXISTING 0.760	NEW 0.855	(HRS/YR)	(kW) 0.08	(kWh/YB) 338	(MBTU) 1.15
	2 P-8000	EF2-3	0.5	0.75	0.600	0.790	4130	0.11	463	1.58
	3 P-8000	PRV3-3	5.0	0.75	0.830	0.896	4130	0.25	1025	3.50
	4 P-8000	AHU 21-1	5.0	0.75	0.830	0.896	8760	0.25	2175	7.42
	5 P-8000	EF 21-1	5.0	0.75		FFICIENCY	İ	5.25	2.75	
	6 P-8000	AHU 21-2	7.5	0.75	0.845	0.914	8760	0.37	3284	11.21
	7 P-8000	EF 21-2	5.0	0.75		FFICIENCY		0.07	323 (11.21
	8 P-8000	AHU 21-3	5.0	0.75	0.830	0.896	8760	0.25	2175	7.42
	9 P-8000	EF 21-3	1.0	0.75	0.760	0.855	8760	0.08	717	2.45
,	0 P-8000	AC 9-1	0.75	0.75	0.720	0.825	1640	0.07	122	0.42
,	1 P-8000	AC 21-1	0.75	0.75	0.720	0.825	1640	0.07	122	0.42
1	2 P-8000	RF21-1	7.5	0.75	0.845	0.914	8760	0.37	3284	11.21
1	3 P-8000	PRV21-2	2.0	0.75	0.790	0.865	8760	0.12	1076	3.67
١,	4 P-8000	RF21-2	7.5	0.75	0.845	0.914	8760	0.37	3284	11.21
	5 P-8000	HV4-1A	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
١,	6 P-8000	HV4-1B	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
1	7 P-8000	HV6-1	1.5	0.75	0.775	0.860	4130	0.11	442	1.51
1	8 P-8000	HV6-2	1.5	0.75	0.775	0.860	4130	0.11	442	1.51
,	9 P-8000	HV6-3	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
1 2	P-8000	HV7-1	5.0	0.75	0.830	0.896	4130	0.25	1025	3.50
2	P-8000	HV7-2	1.5	0.75	0.775	0.860	4130	0.11	442	1.51
2	P-8000	HV8-1	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
2	3 P-8000	HV9-1	3.0	0.75	0.810	0.890	4130	0.19	769	2.63
2	P-8000	EF7-4	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
2	P-8000	PRV8-1	0.5	0.75	0.600	0.790	4130	0.11	463	1.58
2	P-8000	PRV9-1	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
2	7 P-8000	PRV4-1	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
2	B P-8000	PRV4-2	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
2	9 P-8000	PRV4-3	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
3	P-8000	PRV7-3	0.5	0.75	0.600	0.790	4130	0.11	463	1.58
3	1 P-8000	PRV7-4	0.5	0.75	0.600	0.790	4130	0.11	463	1.58
3	2 P-8000	EF4-1	2.0	0.75	0.790	0.865	4130	0.12	507	1.73
3	3 P-8000	PRV6-1	1.0	0.75	0.760	0.855	4130	0.08	338	1.15
3	4 P-8000	PRV6-2	0.75	0.75	0.720	0.825	4130	0.07	306	1.05
3	5 P-8000	PRV6-3	0.5	0.75	0.600	0.790	4130	0.11	463	1.58
1	6					<u>'</u>				
) į	7									
!	8									
-	9									
4	0	SUBTOTAL			C1-0			4.59	27,040.1	92.29

PROJECT: LOCATION: UPDATE EXISTING EEAP STUDY

FORT CARSON, COLORADO

CLIENT PROJECT NO:

CLIENT PROJECT ENC R.W. WHITE

PHASE: PREPARED BY: A. NIEMEYER

INTERIM

EMC PROJECT NO: DATE:

2102-001

07-Apr-93

Page 4 of 5

LINE	BLDG	MOTOR	MOTOR	PART. LOAD	MOT	OB	HOURS OF	ELECTRICAL DEMAND	ANNU ELECTR	000000000000000000000000000000000000000
NO.	NO.	APPLICATION	SIZE	FACTOR	EFFICIE	NCY	OPERATION	REDUCTION	ENERGY S	AVINGS
1	P-8030	HVU-1	(HP) 7.5	(0,0) 0.75	EXISTING 0.845	NEW 0.914	(HRS/YR) 6570	<u>(kW)</u> 0.37	(kWh/YR) 2463	(MBTU) 8.41
2	P-8030	HV-2	15.0	0.75	0.867	0.924	6570	0.60	3923	13.39
3	P-8030	EF-2	15.0	0.75	0.867	0.924	6570	0.60	3923	13.39
.4	P-8030	HV-3	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
5	P-8030	EF-3	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
6	P-8030	HV-4A	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
7	P-8030	EF-4A	25.0	0.75	0.894	0.935	6570	0.69	4508	15.38
8	P-8030	HV-4B	30.0	0.75	0.902	0.938	6570	0.71	4692	16.01
9	P-8030	EF-4B	30.0	0.75	0.902	0.938	6570	0.71	4692	16.01
10	P-8030	HV-5	40.0	0.75	0.902	0.943	6570	0.71	6368	21.73
	P-8030	EF-5	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
11 12	P-8030	Er-5 HV-6	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
13	P-8030	EF-6	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
14	P-8030	HV-7	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
15	P-8030	EF-7	40.0	0.75	0.906	0.943	6570	0.97	6368	21.73
16	, 6555	_, ,	10.0	0.70	0.000	0.0.0	3373	5.57		
17	!		•							
18	P-8142	MZU-1	7.5	0.75	0.845	0.914	6570	0.37	2463	8.41
19	P-8142	RF-1	1.5	0.75	0.775	0.860	6570	0.11	703	2.40
20	P-8142	HV-1	7.5	0.75	0.845	0.914	6570	0.37	2463	8.41
21	P-8142	RF-2	3.0	0.75	0.810	0.890	6570	0.19	1224	4.18
22	P-8142	MAU-3	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
23	P-8142	MAU-4	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
24	P-8142	MAU-5	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
25	P-8142	MAU-6	1.5	0.75	0.775	0.860	6570	0.11	703	2.40
26	P-8142	MAU-7	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
27	P-8142	MAU-8	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
28	P-8142	UH-1A	0.75	0.75	0.720	0.825	6570	0.07	487	1.66
29	P-8142	UH-1B	0.75	0.75	0.720	0.825	6570	0.07	487	1.66
30	P-8142	UH-1C	0.75	0.75	0.720	0.825	6570	0.07	487	1.66
31	P-8142	UH-1D	0.75	0.75	0.720	0.825	6570	0.07	487	1.66
32	P-8142	UH-1E	0.75	0.75	0.720	0.825	6570	0.07	487	1.66
33	P-8142	UH-3A	2.0	0.75	0.790	0.865	6570	0.12	807	2.75
34	P-8142	UH-3B	2.0	0.75	0.790	0.865	6570	0.12	807	2.75
35	P-8142	UH-3C	2.0	0.75	0.790	0.865	6570	0.12	807	2.75
36	P-8142	UH-3D	2.0	0.75	0.790	0.865	6570	0.12	807	2.75
37	P-8142	UH-3E	2.0	0.75	0.790	0.865	6570	0.12	807	2.
38	P-8142	UH-3F	2.0	0.75	0.790	0.865	6570	0.12	807	2.75
39										
40		SUBTOTAL			C1-2			14.38	94,448.7	322.35

EMC ENGINEERS, INC. **ENERGY SAVINGS ESTIMATE - UPGRADE EXISTING MOTORS TO HIGH EFFICIENCY MOTORS**

PROJECT: LOCATION:

PHASE:

UPDATE EXISTING EEAP STUDY

FORT CARSON, COLORADO

INTERIM PREPARED BY: A. NIEMEYER

CLIENT PROJECT NO:

CLIENT PROJECT ENG R.W. WHITE

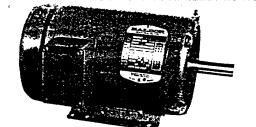
EMC PROJECT NO:

DATE:

2102-001 07-Apr-93

Page 5 of 5

LINE	BLDG	MOTOR	MOTOR	PART. LOAD	MOT	OR	OF	ELECTRICAL DEMAND	ANNU ELECTR	ICAL
NO.	NO.	APPLICATION	SIZE (HP)	FACTOR	EFFICIE EXISTING	NCY NEW	OPERATION (HRS/YR)	REDUCTION (kW)	ENERGY S (kWh/YR)	AVINGS (MBTU)
1	P-8030	EF-1	0.5	0.75	0.600	0.790	6570	0.11	737	2.51
2	P-8030	EF-19A	3.0	0.75	0.810	0.890	4380	0.19	816	2.78
3	P-8030	EF-19B	3.0	0.75	0.810	0.890	4380	0.19	816	2.78
4										
5							,			
6										
7						1				
8										
9										
10										
11										
12										
13										
14										
15										
16										
17								,		
18										
19										
20						:				
21										
22										
23										
24					·					
25										
26										
27										
28										
29										
30										
31				1						
32					:					
33	l									
34										
35										
36										
37										
38										
39		SUBTOTAL						0.48	2,368.4	8.08
40		TOTAL		1	CI-:	\ 7	İ	39.43	247848.1	845.91



I TIMEE TIMOE

TEFC — RIGID BASE

1/8 THRU 7 1/2 H.P.

NEMA 42 THRU 256T

Applications: Pumps, compressors, fans, conveyors, machine tools and other applications where three phase power is available.

Features: Ball bearings. Suitable for mounting in any position. Heavy gauge steel and cast iron frames. Most with open motor service factor.

4	
4	
- 1	

				1 -			4594	A/ 555		I	0.04	1	i	T	1		AP'X.	% EFF.	
H.P.	R.P.M. 60	NEMA	CATALOG	LIST	MULT.	TYPE	AP'X. SHPG.	% EFF. FULL	VOLT.	H.P.	R.P.M. 60	NEMA	CATALOG	LIST	MULT.	TYPE	SHPG.	FULL	VOLT.
	HZ.	FRAME	NO.	PRICE	SYM.	'''-	WGT.	LOAD	CODE	1	HZ.	FRAME	NO.	PRICE	SYM.		WGT.	LOAD	CODE
1/8	1725	42	M3353	\$166	DK	3313M	16	44.0	E	2	3450	56H	M3555	\$258	LK	3524M	39	78.5	E
1/6	3450	42	M3354 d	169	DK	3313M	16	58.0	E	2	3450	145T	M3555T **	258	L1	3524M	40	78.5	E
1/6	1725	42	M3355	189	DK	3316M	17	62.0	E	2	3450	145T	M3586T	336	B1	0524M	54	78.5	E
1/6	1140	48	M3452	195	DK	3408M	17	57.5	Ε	2	3450	184	M3608	397	D1	3617M	52	77.0	E
1/4	3450	42	M3356 d	191	DK	3316M	17	68.0	Ε	2	1725	56H	M3558	245	LK	3528M	42	82.5	E
1/4	1725	48	M3454	151	LK	3410M	19	64.0	Ε	2	1725	145T	M3558T **	245	L1	3528M	42	82.5	E
1/4	1140	48	M3455	216	DK	3411M	19	68.0	E	2.	1750	145T	EM3587T	430	B1	0535M	65	66.5	F
1/4	1140	56	M3531	224	BK	3411M	20	68.0	E	2	1725	145T	M3587T	318	B1	0528M	56	82.5	E
1/4	850	56	M3532	314	DK	3516M	30	55.0	Ε	2	1725	184	M3609	433	D1 L1	3620M 3628M	55 65	82.5 80.0	E
1/3	3450	48	M3457	140	LK	3410M	19	70.0	E	2	1140	184T	M3614T	336 430	B1	0628M	-88∜	80.0	E
1/3	1725	48·	M3458	168	LK	3413M	20	68.0	E	2	1140	184T 213	M3664T M3712	483	Di	3717M	78	78.5	E
1/3	1725	56	M3534	168	LK	3413M	21	68.0	Ε	2 2		213T	M3702T	816	D1	3726M	98	74.0	E
1/3	1140	56	M3535	243	BK	3414M	22	70.0	E	2	850 850	215	M37021	816	D1	3726M	97	74.0	Ē
1/3	850	56	M3536	343	DK	3520M	34	55.0	E						DK	3535M	50	82.5	Ē
1/2	3450	48	M3460	162	BK	3410M	19	68.0	E	3	3450	56H	M3559 †*	326	L1	3535M	51	82.5	E
1/2	3450	56H	M3537	162	LK	3410M	20	68.0	E	3	3450 3450	145T 182T	M3559T †* EM3660T :: **	296 421	81	0626M	95	88.5	F
1/2	1725	48	M3461	198	LK	3416M	22	74.0	E	3	3450	182T	M3660T †*	402	Bi	0620M	82	80.0	E
1/2	1725	56	M3538	198	LK	3416M	22	74.0	Ε	3	3450	182T	M3610T †*	315	Li	3620M	56	81.5	Ē
1/2	1140	56	M3539	262	BK	3418M	24	72.0	E	3	3450	184	M3610 t*	346	01	3620M	56	81.5	Ē
1/2	850	56H	M3560 **	385	DK	3524M	38	66.0	E	3	1725	182T	EM3661T †*	451	B1	0628M	97	89.5	F
1/2	850	182	M3600	495	D1	3614M	47	62.0	E	3	1725	182T	M3611T †	288	Li	3535M	60	84.0	Ē
3/4	3450	48	M3463	178	DK	3413M	20	74.0	E	3	1725	182T	M3611T/36	308	L1	3623M	63	82.5	Ε
3/4	3450	56	M3541	178	LK	3413M	21	74.0	E	3	1725	182T	M3661T †*	412	B1	0623M	86	84.0	Ε
3/4	1725	48	M3464	213	DK	3420M	25	75.5	E	3	1725	184	M3611 †*	314	D1	3623M	59	82.5	Ε
3/4	1725	56	M3542	213	LK	3420M	26 38	75.5	E	3	1725	213	M3703	466	D1	3717M	76	81.5	E
3/4	1140	56H	M3543	268 268	LK L1	3524M 3524M	39	77.0 77.0	E	3	1140	213T	EM3764T †*	648	D1	0735M	153	89.5	F
3/4 3/4	1140 1140	143T 182	M3543T M3601	390	D1	3614M	47	75.5	E	3	1140	213T	M3704T †	424	L1	3726M	99	81.5	E
3/4	850	184	M3602	495	D1	3620M	53	68.0	Ē	3	1140	215	M3704 †*	544	D1	3726M	98	81.5	
1	3450	56	M3545	210	LK	3416M	23	75.5	Ē	3	850	215T	M3705T †	891	D1	3735M	114	77.0	
1	1725	56	M3546	222	LK	3516M	31	77.0	E	5	3450	184T	EM3663T	516	B1	0634M	103	89.5	F
i	1725	143T	M3546T	222	L1	3516M	32	77.0	Ē	5	3450	184T	M3613T †*	363	L1	3628M	70	85.5	E
1	1725	143T	EM3581T	395	B1	0524M	54	85.5	:6 F 365	,5	3450	184T	M3663T †*	513	B1	0634M	100	86.0	E
1.72	1725	143T	M3581T	289	B1	0516M	47	77.0	E	5	3450	213	M3706 †*	606	D1	3717M	81	81.5	_ <u>E</u>
1	1725	182	M3603	355	D1	3614M	47	77.0	Ε	,5 <u>,7</u>	1725	184T	EM3665T †	478	B1	0640M	110	90.2	F
1	1140	56H	M3556	272	LK	3524M	38	75.5	Ε	5 აყაფლ	1725	184T	M3615T †	333	L1	3634M	75	85.5	E
1	1140	145T	M3556T	272	L1	3524M	38	75.5	Ε	15 [3]	1725	184T	M3665T †*	435 591	B1	0634M 3723M	99	84.0 84.0	E
57.40	1140	145T	M3582T	366	B1	0524M	53 🗎	75.5	E	.5 :5:	1725	215 215T	M3707 †* EM3768T †*	917	D1	0750M	178	89.5	F
1	1140	184	M3604	399	D1	3617M	50	77.0	Ε	5	1140 1140	215T	M3708T †*	610	Li	3740M	126	84.0	Ε
1_[850	182T	M3617T **	542	D1	3623M	58	68.0	F	5	1160	254U	M2275 †*	1110	D2	0924M	204	85.5	E
1 1/2	3450	56	M3550	233	BK	3516M	31	75.5	Ε	5	870	254T	M2280T †*	1449	D2	0928M	220	80.0	Ē
1 1/2	3450	143T	M3550T	225	L1	3516M	32	75.5	Ε	7 1/2	3450	184T	M3616T †	476	B1	3640M	88	87.5	E
1 1/2	3450	143T	M3583T	298	B1	0516M	48	75.5	E	7 1/2	3450	213T	EM3769T †*	677	B1	0735M	161	90.2	F
1 1/2	3450	182	M3605	370	D1	3614M	46	74.0	E	71/2	3450	213T	M3769T †*	638	B1	0723M	135	84.0	Ē
1 1/2	1725	56	M3554	237	BK	3520M	34	78.5	E	7 1/2	3450		M3709T †*	536	L1	3723M	99	84.0	Ē
1 1/2	1725		M3554T **	232	L1	3520M	35	78.5	E	7 1/2	3450	215	M3709 †*	626	D1	3723M	99	84.0	Ε
1 1/2	1725	145T	EM3584T	410	B1	0528M	58	85.5	F	71/2	1725	213T	EM3770T †*	651	B1	0735M	157	91.0	F
1 1/2	1725	145T	M3584T	295	B1	0520M	51	78.5	E	71/2	1725	213T	M3770T †*	571	B1	0735M	149	86.5	E
1 1/2	1725	184	M3606	397	D1	3617M	51	81.5 75.5	E F	7 1/2	1725	, ,	M3710T †*	424	L1	3735M	116	87.5	Ε
1 1/2	1140	56H	M3557 †	311	BK	3528M 3528M	41 42	75.5 75.5	F	7 1/2	1725	213T	M3770T-9 †	598	D1	0735M	147	87.0	F
1 1/2 1 1/2	1140	145T 182T	M3557T †	301 316	L1 L1	3623M	57	80.0	E	7 1/2	1760	254U	M2237	925	D2	0924M	204	85.5	E
1 1/2	1140	182T	M3667T	401	B1	0623M	84	80.0	E	7 1/2	1160	254T	EM2276T †*	1266	B2	0940M	261	90.2	F
1 1/2	1140	184	M3607	427	D1	3623M	57	80.0	Ε	7 1/2	1160	254T	M2276T †*	907	L2	0932M	224	84.0	F
1 1/2	850	184T	M3618T †	643	D1	3628M	66	70.0	F	7 1/2	1160	256U	M2276 †*	1334	D2	0932M	252	86.5	<u>E</u>
1 1/2	850	213	M3701	732	D1	3720M	82	70.0	Ė	71/2	870	256T	M2401T †	1782	D2	0940M	269	84.0	F
1 1/2	030	210	MOIVI	132	יי	O1 COM	ا دد												

NOTE: BALDOR NEMA 56H FRAMES WILL ALSO MOUNT AS
NEMA 56, 143T, 145T FRAMES WITH NEMA 56 FRAME SHAFT DIMENSIONS.
VOLTAGE @ 60 HZ: E = 208-230/460, F = 230/460 VOLTS
d = TO BE DISCONTINUED WHEN PRESENT STOCK IS DEPLETED.

SHADED RATINGS ARE CAST IRON FRAMES.

SIGNS AND SYMBOLS:

Catalog Information subject to engineering changes after printing, contact Baldor office for further information.

- Class "B" Rise and Class "B" insulated
- Class "F" Rise and Class "F" insulated †
- Class "F" Insulated Motor with 1.15 Service Factor that operates within Class "B" temperature limits at rated horsepower
- Class "H" Rise and Class "H" insulated ††
- 1 Class I Group D only
- These Close-Coupled Pump Motors (JP) are suitable \Diamond for "West Coast Fit" Mounting.
- These Motors are Totally-Enclosed, Non-Ventilated Continuous Duty.
- These Brake Motors can be mounted for Vertical Mounting with Brake Above or Below Motor
- These Brake Motors can be mounted for Vertical Mounting with Brake Below Motor
- These Agri-Duty Motors are Capacitor-Start, Induction-Run
- These Repulsion-Start Induction-Run Motors are rated 10 HP Continuous Duty, 15 HP One Hour Duty
- These Resilient Mount Single Phase Motors have Moderate Starting Torque for Fan Applications
- These SCR Motors have a 3:1 Speed Range at Constant Torque
- Items to be Discontinued when Present Stock is ď Depleted

INSULATION CLASS: Absence of symbol(s) adjacent to catalog number generally indicates the motor is designed to operate within Class A temperature limits (even though Class B or better materials are used). Exceptions occur in DC Motors and Special Purpose motors. Contact a Baldor representative for information on a particular motor,

VOLTAGE/POWER SERVICE:

Voltage Code	
A	115/208-230 Volts, 60 HZ
B	115/230 Volts, 60 HZ
C	
D	208-230 Volts, 60 HZ
E	208-230/460 Volts, 60 HZ
F	230/460 Volts, 60 HZ
G	
H	
1	
J	110/220 Volts, 50 HZ
K	220/380/440 Volts, 50 HZ
L	
M	
N	380/460 Volts, 50/60 HZ
0	2300/4160 Volts, 60 HZ
V	

a letter or letters and four non-significant numbers. A suffix letter(s) and/or number may also be part of catalog number. For example L3510 or L3510T. Prefix and suffix letters are defined below:

PREFIXES TO CATALOG NUMBERS:

AEM	Automotive Motor (GM-7EHQ)	М	Denotes Three Phase
AF	Aeration Fan Motor	M (Pg. 80)	Multipurpose Soft Start
AM	Automotive Motor (GM-7EQ)	MM	Metric Dimension Motor with
ANF	Auger Flange Motor		Rigid Base
AO	Air Over Motor	MVM	Metric Dimension Motor
AP	Subfractional HP Permanent		Flange Mount
H.F	Magnet Motor	MPM	Three Phase Metering Pump
В	Motor mounted spring set disc	****	Motor
b	brake	OF	Design D, High Slip Motor (Oil
ВС	DC Motor Speed Control	•	Field)
BIM	BISSC Approved Motor	Р	Pressure Washer Motor
BMC	Brushless DC Motor Control	PSC	Permanent Split Capacitor
BTG	Tachometer Generator	R	Repulsion-Start, Induction-run
C	NEMA C-Face with Rigid Base	••	Motor
CDP	Permanent Magnet SCR Drive	RL&RM	Resilient Base (Cradle Mount)
UUF	Motor	S	Single Phase Soft Start
COPT	Permanent Magnet SCR Drive	Ť	Torque Control Soft Start
UUFI	Motor with Integral Tach	ÙC	Universal Crop Dryer Motor
COPWO	Permanent Magnet SCR Drive .	v	NEMA C-Face, Round Body,
CUPYVU	Motor Washdown	•	less Base
CF	Condenser Fan Motor	WLV	NEMA JM Pump Shaft and
CH CH	Direct Drive Fan Motor with	••••	Face less Base
UN	Resilient Base	VLCP	P Base Vertical Pump Motor,
CP	Chemical Processing Corrosion	1201	Medium Thrust
UP	Protected Motor	VP	Permanent Magnet SCR Drive
CSC	Checkout Stand Motor	••	Motor with Metric Face or
D D	Direct Current Shunt or		Flance
ט	Compound Motor	VPCP	P Base Vertical Pump Motor,
D (Pg. 80)	Definite Purpose Soft Start	** •	High Thrust
D (ry. ov) DB	Brushless DC Motor	VPM	Vertical Pump Motor
DE DE	Vacuum Pump Motor	WC	West Coast Fit NEMA TCZ
DMG	Lifting Magnet Generator	WDM	Washdown Duty Motors
DIVIG	Motor	ZD	Vector Drive
E	Super-E Premium Efficiency	ZDM	Vector Drive Motor
C	Motor		
ECP	Super E Premium Efficiency,	SUFFIX	ES TO CATALOG
LUF	oupor a romani amoionoj,	AULIMADE	ne.

SUFFIXES TO CATALOG NUMBERS:

Α	Automatic Thermal Overload
BV	Blower Vented
Ĕ.	Electric Switch
м	Manual Thermal Overload
-4	460 Volt Winding
-5	575 Volt Winding
-8	200 Volt Winding
-0 -9	NEMA Design C High Torque
-9	
	Winding
-50	Wound for 50 Hertz Service
-2341	2300/4160 Volt Winding
4	Explosion-Proof, 1.15 Service
	Factor
-P	Partial Motor: Does not include
•	pulley end plate (AC motors
	only)
100	
/36	Full 180 Frame Band Diameter

/36	Full 180 Frame Band Diameter
ОТНЕ	R ABBREVIATIONS USED:
C	Permanent Split Capacitor
LC	Capacitor-Start, Capacitor-Rur
	Motor
L	Capacitor-Start, Induction-Rur
S	Split Phase
T	NEMA "T" Frame Dimensions
TS	NEMA "TS" Frame Short
	Shaft
X	Explosion-Proof

ECP

FD

GC

GCP

GD

GP

GPP

GS

ID IDM

IM

IR

J

JM

JP

K

LDG

Chemical Processing, Corrosion Protected Motor F-2 Mount Motor

Farm Duty Motors

Subfractional HP Gear Motor

Right Angle Shaft Gearmotor

Subfractional HP Permanent

Permanent Magnet Parallel

Instant Reversing Single Phase

Permanent Split Capacitor

Permanent Split Capacitor

Parallel Shaft Gearmotor Centrifugal Fan Motor

Magnet Gearmotor

Shaft Gearmotor **Grain Stirring Motor**

Inverter Drive Motor Irrigation Drive Motor

Farm Motor NEMA 56J Stainless Steel Threaded Shaft

NEMA JM Pump shaft and

NEMA JP Pump shaft and Face with Rigid Base

Model 34 Diameter Motor with 56 C-Face, less Base **Denotes Single Phase**

Single Phase, Door and Gate

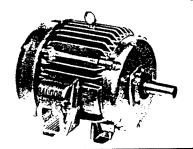
Face with Rigid Base

Inverter Drive

with Drip-Cover and Automatic Thermal

Overload

Motors



THREE PHASE TEFC — RIGID BASE

10 THRU 500 H.P.

NEMA 215T THRU 5011L

Applications: Pumps, compressors, fans, conveyors, machine tools and other applications where three phase power is available.

Features: Ball bearings. Suitable for mounting in any position. Heavy gauge steel and cast iron frames. Most with open motor service factor.

						1		AP'X.	% EFF.			R.P.M.						AP'X.	% EFF.	1
H.P.	R.P.M. 60	NEMA	CATALO	og	LIST	MULT.	TYPE	SHPG.	FULL	VOLT.	H.P.	60	NEMA	CATALOG	LIST	MULT.	TYPE	SHPG.	FULL	VOLT.
n.r.	HZ.	FRAME	NO.	-	PRICE	SYM.		WGT.	LOAD	CODE		HZ.	FRAME	NO.	PRICE	SYM.		WGT.	LOAD	CODE
10	3450	215T	EM3771T	†*	\$793	B1	0740M	170	91.0	F	50	1160	365T	EM4312T †*	\$5965	D2 '	1468M	807	93.6	gF.
10	3450	215T	M3771T	†*	682	B1	0735M	157	85.5	Ε	50	1160	365T	M4312T †*	4410	B2	1458M	750	91:0	彩F心
10	3450	215T	M3711T	†•	578	L1	3735M	121	85.5	E	60	3525	364TS	EM4310T †*	4606	D2	1458M	748	94.1	₽.E.
10	3525	254U	M2393		1036	D2	0924M	215	87.5	E	60	3525	364TS	M4310T †*	4046	B2	1440M	749	90.2	₹ Fa83
10	1725	215T	EM3774T	†*	732	B1	0750M	183	91.7	F	60	1760	364T	EM4314T †*	4501	B2 ∵	1462M	784	95.0	F
10	1725	215T	M3774T	t	616	81	0740M	163	87.5	E	60	1760	364T	M4314T †*	3633	L2	1442M	673		#FIG
10	1725	215T	M3714T	Ť	516	L1	3740M	127	87.5	E	60	1160	404T	EM4403T †*	6230	D2	1672M	1110	94.1	#F∞
10	1725	215T	M3774T-9	† d	746	D1	0740M	162	87.0	F	60	1160	404T	M4403T †*	4901	B2	1652M	1007	91.7	\$ F.₹
10	1760	256U	M2238	+•	1159	D2	0932M	248	85.5	E	75	3525	365TS	EM4313T †*	5878	D2	1472M	827	94.1	XF.
10	1160	256T	EM2332T	†°	1525	B2	0952M	277	90.2	F	75	3525	365TS	M4313T †*	5157	B2	1448M	804	91.0	常用
10	1160	256T	M2332T	<u> </u>	1109	L2	0940M	251	85.5	F	75	1760	365T	EM4316T †*	5260	B2	1480M	865	95.0	F
10	1160	284U	M2332	+•	1702	D2	1028M	375	86.5	E	75	1760	365T	M4316T †*	4374	L2	1452M	858	92.4	F
•	870	284T	M2402T	+•	2174	D2	1040M	364	84.0	F	75	1760	444U	M4316 † d	6588	D2	1852M	1315	91.0	E
10						B2	0940M	270	91.7	F	75	1160	405T	EM4404T †*	8308	D2	1684M	1164	94.1	F
15	3525	254T	EM2394T	<u> †•</u>	1112	B1	3744M	134	85.5	F	75	1160	405T	M4404T †*	5801	B2	1662M	1085	92.4	F
15	3450	215T	M3713T		823	12	0926M	238	86.5	F				EM4402T-4 †*	7591	D2	1668M	1076	94.5	ar G
15	3525	254T	M2394T	†*	864	D2	0932M	270	89.5	Ε	100	3525	405TS	M4402T-4	6347	B2	1672M	1111	93.0	G
15	3525	256U	M2394	<u>+•</u>	1078	B2	0932M	253	92.4	F	100	3525	405TS	EM4400T-4 †*	7180	B2	1680M	1153	95.0	Ğ
15	1760	254T	EM2333T	†*	1045		0932M	231	88.5	F	100	1760		M4400T †	5825	L2	1658M	1049	93.0	V.F.
15	1760	254T	M2333T	†*	842	L2	0936M	283	87.5	F	100	1760	405T		10850	D2	1880M	1535	94.5	Z FA
15	1760	254T	M2333T-9	† *	1045	D2	1030M	346	87.5	Ε	100	1160	444T	EM4409T †*	7282	B2	1868M	1428	93.6	λ F i [©]
15	1760	284U	M2333	<u> †•</u>	1597	D2		393	91.0	F	100	1160	444T				1870M	1427	94.1	G
15	1160	284T	EM4100T	I.	2120	D2	1050M 1040M	375	87.5	F	125	3525	444TS	EM4412T-4 †	9965	D2	1860M	1750	93.6	G
15	1160	284T	M4100T	†*	1476	12	1232M	446	89.5	E	125	3525	444TS	M4412T-4 †*	9001	B2	1880M	1519	95.0	Ğ
15	1160	324U	M4100	<u>+•</u>	2313	D2		436	86.5	F	125	1780	444T	EM4410T-4 †*	9135	B2	1860M	1529	93.6	G
15_	870	286T	M2395T	<u>†•</u>	3056	D2	1050M				125	1760	444T	M4410T-4 †*	7860	L2		1648	94.5	G
20	3525	256T	EM4106T	†°	1376	B2	0948M	285	92.4	F	125	1160	445T	EM4411T-4	12630	D2	1892M	1		Ğ
20	3525	256T	M4106T	†*	1109	12	0934M	262	88.5	F	125	1160	445T	M4411T-4 †*	9988	B2	1884M	1724	94.1	
20	3525	286U	M4106	<u>†•</u>	1642	D2	1036M	398	90.2	E	150	3525	445TS	EM4413T-4 †*	12177	D2	1890M	1750	94.1	G
20	1760	256T	EM2334T	†•	1266	B2	0952M	290	93.0	F	150	3525	445TS	M4413T-4 †*	10963	B2	1872M	1800	94.1	G
20	1760	256T	M2334T	†*	1040	L2	0942M	265	89.5	F	150	3525	445TS	ECP4413T-4	14100	B2	1890M	1698	94.1	G
20	1760	256T	M2334T-9	†• d	1239	D2	0948M	365	88.5	F	150	1760	445T	EM4406T-4 †*	11417	B2	1890M	1647	95.0	G
	1	00011					100011												93.6	l G
20	1760	286U	M2334	<u>†*</u> _	1911	D2	1036M	384	88.5	E	150	1760	445T	M4406T-4 †*	9383	L2	1872M	1705		- C
20 20	1160	286T	M2334 EM4102T	1.	2511	D2	1060M	441	91.7	F	150 150	1760 1760	445T 445T	M4406T-4 †* ECP4406T-4	9383 13129	B2	1890M	1624	95.0	G G
								441 466	91.7 88.5	F			1 .			B2 D2	1890M 18112M		95.0	G G
20	1160	286T	EM4102T	†°	2511	D2	1060M 1050M 1240M	441 466 493	91.7 88.5 90.2	F	150	1760	445T	ECP4406T-4	13129	B2 D2 B2	1890M 18112M 1800M		95.0	G G
20 20	1160 1160	286T 286T	EM4102T M4102T	†°	2511 1882	D2 B2	1060M 1050M	441 466	91.7 88.5 90.2 88.5	# # #	150 150	1760 1160	445T 447T	ECP4406T-4 EM44156T-4	13129 14775	B2 D2	1890M 18112M	1624	95.0	G G G
20 20 20 20	1160 1160 1160	286T 286T 326U	EM4102T M4102T M4102	†°	2511 1882 2275	D2 B2 D2	1060M 1050M 1240M	441 466 493	91.7 88.5 90.2 88.5 91.0	н н н п н	150 150 150	1760 1160 1160	445T 447T 447T	ECP4406T-4 EM44156T-4 M44153T-4	13129 14775 11398	B2 D2 B2	1890M 18112M 1800M 1800M 1800M	1624 1850	95.0	G G G
20 20 20	1160 1160 1160 870	286T 286T 326U 324T	EM4102T M4102T M4102 M4112T	†°	2511 1882 2275 3150	D2 B2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M	441 466 493 529 280 398	91.7 88.5 90.2 88.5 91.0 93.0		150 150 150 150	1760 1160 1160 1160	445T 447T 447T 447T	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4	13129 14775 11398 15155	B2 D2 B2 D2 D2 B2	1890M 18112M 1800M 1800M 1800M	1624 1850 1850	95.0 (94.5)	G G G G
20 20 20 20 25 25	1160 1160 1160 870 3525	286T 286T 326U 324T 256T	EM4102T M4102T M4102 M4112T M4118T	†°	2511 1882 2275 3150 1376	D2 B2 D2 D2 L2	1060M 1050M 1240M 1250M 0946M 1044M 1032M	441 466 493 529 280 398 392	91.7 88.5 90.2 88.5 91.0 93.0 87.5		150 150 150 150 150	1760 1160 1160 1160 3525	445T 447T 447T 447T 447TS	ECP4406T-4 EM44156T-4 M44155T-4 ECP44156T-4 EM4416T-4	13129 14775 11398 15155 14947	B2 D2 B2 D2	1890M 18112M 1800M 1800M 1800M 1800M	1624 1850 1850 1850	95.0 (94.5)	G G G G
20 20 20 20 25 25 25	1160 1160 1160 870 3525 3525	286T 286T 326U 324T 256T 284TS	EM4102T M4102T M4102 M4112T M4118T EM4107T	†°	2511 1882 2275 3150 1376 1738	D2 B2 D2 D2 L2 B2	1060M 1050M 1240M 1250M 0946M 1044M	441 466 493 529 280 398 392 396	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5		150 150 150 150 200 200	1760 1160 1160 1160 3525 3525	445T 447T 447T 447T 447TS 447TS	ECP4406T-4 EM44156T-4 M44155T-4 ECP44156T-4 EM4416T-4	13129 14775 11398 15155 14947 12610	B2 D2 B2 D2 D2 B2	1890M 18112M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 1850 2003	95.0 (94.5) (95.8) (96.2)	G G G G G G G
20 20 20 20 25 25	1160 1160 1160 870 3525 3525 3525	286T 286T 326U 324T 256T 284TS 284TS	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T	†°	2511 1882 2275 3150 1376 1738 1389	D2 B2 D2 D2 L2 B2 L2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M	441 466 493 529 280 398 392 396 447	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1		150 150 150 150 200 200 200	1760 1160 1160 1160 3525 3525 3525	445T 447T 447T 447T 447TS 447TS 447TS	ECP4406T-4 EM44156T-4 M44156T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4	13129 14775 11398 15155 14947 12610 16770	B2 D2 B2 D2 D2 B2 D2 B2 L2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1892M	1624 1850 1850 1850 2003 1753	95.0 (94.5) (95.8) (96.2) 94.1	G G G G G G G
20 20 20 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525	286T 286T 326U 324T 256T 284TS 284TS 324U	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4107	†* †* †* †* †*	2511 1882 2275 3150 1376 1738 1389 2426	D2 B2 D2 D2 L2 B2 L2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M	441 466 493 529 280 398 392 396 447 359	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5		150 150 150 150 200 200 200 200	1760 1160 1160 1160 3525 3525 3525 1760	445T 447T 447T 447TS 447TS 447TS 447TS	ECP4406T-4 EM44156T-4 M44156T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4	13129 14775 11398 15155 14947 12610 16770 12900	B2 D2 B2 D2 D2 B2 D2 B2	1890M 18112M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 1850 2003	95.0 (94.5) (95.8) (96.2)	G G G G G G
20 20 20 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525 1760	286T 286T 326U 324T 256T 284TS 284TS 324U 284T	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4107 EM4103T	†* †* †* †*	2511 1882 2275 3150 1376 1738 1389 2426 1658	D2 B2 D2 D2 L2 B2 L2 D2 B2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M	441 466 493 529 280 398 392 396 447	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2		150 150 150 150 200 200 200 200 200	1760 1160 1160 1160 3525 3525 3525 1760 1760	445T 447T 447T 447TS 447TS 447TS 447TS 447T	ECP4406T-4 EM44156T-4 M44156T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 M4407T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318	B2 D2 B2 D2 D2 B2 D2 B2 L2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1892M	1624 1850 1850 1850 2003 1753	95.0 (94.5) (95.8) (96.2) 94.1	G G G G G
20 20 20 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525 1760 1760	286T 286T 326U 324T 256T 284TS 324U 284T 284T	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4107 EM4103T	†* †* †* †*	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285	D2 B2 D2 D2 L2 B2 L2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1034M 1044M 1234M	441 466 493 529 280 398 392 396 447 359 388 458	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7		150 150 150 150 200 200 200 200 200 200	1760 1160 1160 1160 3525 3525 3525 1760 1760	445T 447T 447T 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44155T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 M4407T-4 M4407T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680	B2 D2 B2 D2 D2 B2 D2 D2 D2 B2 L2 D2 B2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18120M 1800M 18140M 1800M	1624 1850 1850 1850 2003 1753	95.0 (94.5) (95.8) (96.2) 94.1 95.0	G G G G G G G
20 20 20 25 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525 1760 1760 1760	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4107 EM4103T M4103T M4103T-9	†; †; †; †;	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620	D2 B2 D2 D2 L2 B2 L2 D2 B2 L2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1034M 1044M 1234M 1256M	441 466 493 529 280 398 392 396 447 359 388 458 548	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7		150 150 150 150 200 200 200 200 200 200 200	1760 1160 1160 1160 3525 3525 3525 1760 1760 1760	445T 447T 447T 447T 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44155T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 M4407T-4 ECP4407T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510	B2 D2 B2 D2 D2 B2 D2 B2 L2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1892M 1800M 18140M	1624 1850 1850 1850 2003 1753	95.0 (94.5) (95.8) (96.2) 94.1	G G G G G G G G G G G G G G G G G G G
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525 1760 1760 1760	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T 284T 284T 324U	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4107 EM4103T M4103T M4103T-9 M4103	†; †; †; †;	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376	D2 B2 D2 D2 L2 B2 L2 D2 B2 L2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1034M 1044M 1234M 1256M 1248M	441 466 493 529 280 398 392 396 447 359 388 458 548	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5		150 150 150 150 200 200 200 200 200 200 200 200	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160	445T 447T 447T 447TS 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 ECP4407T-4 M44206T-4 M44206T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633	B2 D2 B2 D2 D2 B2 D2 D2 D2 B2 L2 D2 B2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1892M 1800M 18140M 1800M 1800M	1624 1850 1850 2003 1753 2003	(94.5) (95.8) (96.2) 94.1 95.0 (95.8)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 1760 1760 1760 1760 1180	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T 284T 324U 324T	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4107 EM4103T M4103T M4103T-9 M4103 EM4111T	#* #* #* #* #* #* #*	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974	D2 B2 D2 D2 L2 B2 L2 D2 B2 L2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1034M 1044M 1234M 1256M	441 466 493 529 280 398 392 396 447 359 388 458 548	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7		150 150 150 150 200 200 200 200 200 200 200 200	1760 1160 1160 1160 3525 3525 1760 1760 1160 1160	445T 447T 447T 447TS 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 EM44206T-4 M44206T-4 ECP44206T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600	B2 D2 B2 D2 D2 B2 D2 B2 L2 D2 D2 B2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 1800M	1624 1850 1850 2003 1753 2003	(94.5) (95.8) (95.8) (96.2) 94.1 95.0 (95.8)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 1760 1760 1760 1180 1160	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T 324U 324T 324T 324T	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4103T M4103T	#: #: #: #: #: #:	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259	D2 B2 D2 D2 L2 B2 L2 D2 B2 L2 D2 D2 D2 B2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1034M 1044M 1234M 1256M 1248M	441 466 493 529 280 398 392 396 447 359 388 458 548	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5		150 150 150 150 200 200 200 200 200 200 200 250	1760 1160 1160 1160 3525 3525 1760 1760 1160 1160 1160	445T 447T 447T 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44156T-4 ECP44156T-4 EM4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 EM44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 EM4408T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600	B2 D2 B2 D2 D2 B2 D2 B2 L2 D2 D2 B2 B2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1892M 1800M 18140M 1800M 1800M	1624 1850 1850 2003 1753 2003	(94.5) (95.8) (96.2) 94.1 95.0 (95.8)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525 1760 1760 1760 1180 1160 870	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T 324U 324T 324T 324T 326T	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T-9 M4103 EM4111T M4111T M4116T	†* †* †* †* †* †* †* †* †* †* †* †* †* †	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806	D2 B2 D2 D2 L2 B2 L2 D2 B2 L2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1248M 1262M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 89.5		150 150 150 150 200 200 200 200 200 200 250 250 250	1760 1160 1160 1160 3525 3525 1760 1760 1160 1160 1760 1760	445T 447T 447T 447TS 447TS 447TS 447T 447T 449T 449T 449T 449T 449T 449T 449T 449T 449T 449T 449T	ECP4406T-4 EM44156T-4 M44156T-4 ECP4416T-4 M4416T-4 ECP4407T-4 EM4407T-4 EM44206T-4 M44206T-4 ECP44206T-4 EM4408T-4 M4408T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491	B2 D2 B2 D2 B2 D2 B2 L2 D2 B2 D2 B2 D2 B2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18140M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 2003 1753 2003	(95.8) (95.8) (95.8) (95.8) (95.8) 94.5 (96.2) (95.2)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 870 3525 3525 3525 3525 1760 1760 1760 1180 1160 870 3525	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T 324U 324T 324T 324T 326T 286TS	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4103T M4103T M4103T M4103T M4103T	†; †; †; †; †;	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1248M 1256M 1262M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 89.5 93.0		150 150 150 150 200 200 200 200 200 200 200 250 250 2	1760 1160 1160 1160 3525 3525 1760 1760 1160 1160 1760 1760 1760 1800	445T 447T 447T 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44156T-4 ECP44156T-4 EM4416T-4 ECP4416T-4 ECP4407T-4 M4407T-4 EM44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240	B2 D2 B2 D2 B2 D2 B2 L2 D2 B2 D2 B2 D2 B2 D2	1890M 18112M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 2003 1753 2003	(94.5) (94.5) (95.8) (96.2) 94.1 95.0 (95.8) 94.5 (96.2)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 3525 3525 3525 3525 1760 1760 1760 1180 1160 870 3525 3525	286T 286T 326U 324T 256T 284TS 324U 284T 284T 284T 324U 324T 324T 326T 286TS 286TS	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4101T M4111T M4111T M4111T M4116T EM4108T M4108T	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598	D2 B2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1032M 1050M 1034M 1234M 1256M 1248M 1262M 1050M 1038M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 89.5 93.0 88.5		150 150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1760 1760 1800 1800	445T 447T 447T 447TS 447TS 447TS 447T 447T 449T 449T 449T 449T 5007L	ECP4406T-4 EM44156T-4 M44156T-4 ECP44156T-4 EM4416T-4 ECP4416T-4 ECP4407T-4 ECP4407T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405	B2 D2 B2 D2 B2 D2 B2 L2 D2 B2 L2 D2 B2 L2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18120M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1850 1850 1850 2003 1753 2003	(95.8) (95.8) (95.8) (95.8) (95.8) 94.5 (96.2) (95.2)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 370 3525 3525 3525 1760 1760 1760 1180 1180 3525 3525 1760 1760 1760	286T 286T 326U 324T 284TS 284TS 324U 284T 284T 324T 324U 324T 324T 326T 286TS 286TS	EM4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4101T M4111T M4111T M4116T EM4108T M4108T EM4104T	1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1: 1	2511 1882 2275 3150 1376 1378 1389 2426 1658 1285 1620 2376 2279 23806 2078 1598 1969	D2 B2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1050M 1034M 1044M 1234M 1256M 1248M 1050M 1038M 1058M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 93.6 89.5 93.0 88.5 94.1		150 150 150 200 200 200 200 200 200 200 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1160 1200 1800 1200	445T 447T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 5007L 449T 5009L	ECP4406T-4 EM44156T-4 M44157T-4 ECP4416T-4 M4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 EM44206T-4 M44206T-4 M44206T-4 EM4408T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4 ECP44206T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405	B2 D2 B2 D2 B2 D2 B2 L2 D2 B2 L2 D2 B2 L2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1850 1850 1850 2003 1753 2003	(95.8) (95.8) (95.8) (95.8) (95.8) (95.8)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 370 3525 3525 3525 1760 1760 1760 1180 1160 870 3525 1760 1760 1760 1760	286T 286T 326U 324T 284TS 284TS 284TS 324U 284T 284T 324T 324T 324T 326T 286TS 286TS 286T 286T 286T	EM4102T M4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4101 M4111T M4111T M4116T EM4108T M4108T EM4104T M4104T	t, t, t, t, t, t, t, t, t, t, t, t, t, t	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 L2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1050M 1034M 1234M 1256M 1248M 1260M 1050M 1050M 1050M 1050M 1050M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 417 413 436 380	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 93.0 88.5 94.1 90.2		150 150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1160 1800 1800 1200 1200	445T 447T 447T 447TS 447TS 447TS 447T 447T	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM44206T-4 M44206T-4 ECP44206T-4 ECP44206T-4 ECP4408T-4 ECP4408T-4 ECP50254L-2341 ECP44256T-4 ECP50256L-2341 ECP44304T-4	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277	B2 D2 B2 D2 B2 D2 B2 L2 D2 B2 L2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1850 1850 1850 2003 1753 2003	95.0 (94.5) (95.8) (95.8) (95.8) (95.8) (95.2) (95.2) (95.8) (94.5)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 370 3525 3525 3525 1760 1760 1760 1180 1180 3525 3525 1760 1760 1760	286T 286T 326U 324T 284TS 284TS 324U 284T 284T 324T 324T 324T 326T 326T 286TS 286TS 286T 286T	EM4102T M4102T M4102T M4112T M4112T M4118T EM4107T M4107T M4103T M4103T M4103T-9 M4103 EM4111T M4111T M4116T EM4108T EM4108T EM4104T M4104T-9	t, q	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518 1912	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 L2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1262M 1050M 1058M 1058M 1050M 1050M 1050M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 89.5 93.0 88.5 94.1 90.2 91.0		150 150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1160 1200 1200 1200 1800	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 449T 5007L 449T 5009L	ECP4406T-4 EM44156T-4 M44155T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM44206T-4 M44206T-4 ECP44206T-4 ECP44206T-4 ECP4408T-4 ECP4408T-4 ECP502254L-2341 ECP44256T-4 ECP502256L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895	B2 D2 B2 D2 B2 D2 B2 L2 D2 B2 L2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1800M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1850 1850 1850 2003 1753 2003	(95.8) (95.8) (96.2) (95.8) (95.8) (95.8) (95.8) (95.8) (95.8) (96.2) (96.2)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 370 3525 3525 3525 3525 1760 1760 1760 1180 3525 3525 1760 1160 870	286T 286T 326U 324T 284TS 284TS 284TS 284T 284T 324U 324T 324T 326T 286TS 286TS 286T 286T 286T 286T 326U	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4107T EM4103T M4103T-9 M4103 EM4111T M4111T M4116T EM4108T EM4104T M4104T-9 M4104	t, q, t, d,	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518 1912 2820	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1262M 1050M 1038M 1050M 1050M 1050M 1050M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418 498	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 89.5 93.0 88.5 94.1 90.2 91.0 92.4		150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1160 1200 1200 1800 1200 1800 1800	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 449T 5007L 449T 5009L 449T	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM4206T-4 EM44206T-4 ECP44206T-4 ECP44206T-4 ECP4408T-4 ECP50254L-2341 ECP50256L-2341 ECP50304L-2341 ECP44304T-4 ECP50304L-2341	13129 14775 11398 15155 14947 12610 11300 11318 14680 15510 13633 17600 14491 18240 31405 22340 41277 24895 37660	B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18140M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 1850 2003 1753 2003	(95.8) (95.8) (95.8) (95.8) (95.8) (95.2) (95.2) (95.8) (96.2) (96.2) (95.4)	6666666666666666666666666666666666666
20 20 20 25 25 25 25 25 25 25 25 25 25 25 30 30 30 30 30 30 30 30 30 30 30 30 30	1160 1160 1160 370 3525 3525 3525 3525 1760 1760 1760 1180 3525 3525 1760 1760 1760 1760 1760 1760 1760	286T 286T 326U 324T 284TS 284TS 324U 284T 324T 324T 324T 326T 286TS 286TS 286T 286T 326U 326T 326U 326T 326T 326T 326T	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4107T M4103T M4103T-9 M4103 EM4111T M4111T M4111T M4116T EM4108T EM4104T M4104T-9 M4104 M4104T-9 M4104 EM4117T M4117T	t. d. t. d.	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518 1912 2820 3425	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1262M 1050M 1058M 1058M 1050M 1050M 1050M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 520 586 417 413 436 380 418 498	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 93.0 88.5 94.1 90.2 91.0 92.4		150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1160 1200 1200 1800 1200 1800 1200	445T 447T 447TS 447TS 447TS 447TS 447TI 447T 449T 449T 449T 5007L 449T 5009L 449T 5009L 449T 5009L	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM4206T-4 EM44206T-4 ECP44206T-4 ECP4408T-4 ECP50254L-2341 ECP50256L-2341 ECP44304T-4 ECP50304L-2341 ECP44306T-4 ECP50306L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 14491 18240 31405 22340 41277 24895 37660 28510	B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1850, 1850, 1850, 1850, 2003, 1753, 2003,	95.0 (94.5) (95.8) (95.8) (95.8) (95.2) (95.8) (96.2) (95.4) (95.8) (95.8)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 3525 3525 3525 3525 1760 1760 1760 1180 3525 1760 1760 1760 1760 1760 1760 1760 1760	286T 286T 326U 324T 256T 284TS 324U 284T 324T 324T 324T 326T 286TS 286TS 286T 286T 286T 326U 326T 326U 326T 326T 326T 326T 326T 326T 326T 326T	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4107T M4103T M4103T M4103T M4103T M4103T M4104T	t. q. t. d.	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518 1912 2820 3425 2605	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1262M 1050M 1058M 1058M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 520 586 417 413 436 380 418 498 584 565	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 93.0 88.5 94.1 90.2 91.0 92.4 93.0 90.2		150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1200 1200 1200 1800 1200 1200 1200 120	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 449T 5007L 449T 5009L 449T 5009L 449T 5011L	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM4206T-4 ECP44206T-4 ECP4408T-4 ECP4408T-4 ECP50254L-2341 ECP44304T-4 ECP50304L-2341 ECP44306T-4 ECP50304L-2341 ECP50306L-2341 ECP50306L-2341	13129 14775 11398 15155 14947 12610 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894	B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 1850 2003 1753 2003	95.0 (94.5) (95.8) (95.8) (95.8) (95.8) (95.2) (95.8) (96.2) (95.4) (95.8) (95.8) (95.8) (95.8) (95.8)	6666666666666666666666666666666666666
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 3525 3525 3525 3525 1760 1760 1180 3525 3525 1760 1760 1760 1760 1760 1760 1760 1760	286T 286T 326U 324T 256T 284TS 324U 284T 324T 324T 324T 326T 286TS 286T 286T 286T 286T 286T 326U 326T 326T 326T 326T 326T 326T 326T 326T	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4103T EM4111T M4116T EM4108T M4104T M4104T M4104T M4104T M4104T M4104T M4107 M4107 M4107 M4107 M4107 M4109T	†* †* †* †* †* †* †* †* †* †*	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1919 2820 3425 2605 2598	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1034M 1234M 1256M 1262M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418 498 584 565	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 89.5 93.0 88.5 94.1 90.2 91.0 92.4 93.0 90.2	<u></u>	150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1200 1200 1800 1200 1800 1200 1200 120	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 449T 5007L 449T 5009L 449T 5009L 5011L 5011L	ECP4406T-4 EM44156T-4 M44153T-4 ECP44156T-4 EM4416T-4 ECP4416T-4 ECP4416T-4 EM4407T-4 EM4407T-4 EM4206T-4 ECP44206T-4 ECP4408T-4 ECP50254L-2341 ECP44304T-4 ECP50304L-2341 ECP50306L-2341 ECP50306L-2341 ECP50305L-2341 ECP50305L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 48510	B2 D2 B2 C2 D2 B2 D2 B2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M	1624 1850 1850 1850 2003 1753 2003	95.0 (94.5) (95.8) (95.8) 94.5 (95.2) (95.2) (95.2) (95.4) (95.4) (95.8) (95.1) (95.1)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 3525 3525 3525 3525 1760 1760 1760 1180 3525 3525 1760 1760 1760 1760 1760 1760 1760 1760	286T 286T 326U 324T 284TS 284TS 324U 284T 284T 324T 324T 324T 326T 286TS 286T 286T 326T 326T 326T 326T 326T 326T 326T 32	EM4102T M4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4104T M4111T M4111T M4111T M4114T M4104T M	t. t. t. t. t. t. t. t. t. t. t. t. t. t	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1912 2820 3425 2605 2598 2180	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 E2 D2 D2 D2 D2 D2 D2 D2 D2 E2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1262M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1050M 1240M 1256M 1256M 1256M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418 498 584 565	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 90.2 91.0 92.4 93.0 90.2 93.0 88.5	<u></u>	150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 1760 1760 1160 1160 1160 1200 1200 1200 1200 12	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 5007L 449T 5009L 449T 5009L 449T 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44153T-4 ECP4416T-4 ECP4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM4407T-4 EM4206T-4 ECP44206T-4 ECP44206T-4 ECP4426T-4 ECP50256L-2341 ECP44304T-4 ECP50304L-2341 ECP50306L-2341 ECP50306L-2341 ECP50306L-2341 ECP503056L-2341 ECP503056L-2341	13129 14775 11398 15155 14947 12610 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 48510 35106	B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M N5007M 1800M N5007M 1800M N5007M 1800M N5011M N5011M	1624 1850 1850 1850 2003 1753 2003	95.0 (94.5) (95.8) (95.8) 94.5 (95.2) (95.2) (95.2) (95.4) (95.3) (95.1) (95.4) (95.1) (96.2)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 3525 3525 3525 3525 1760 1760 1760 1180 1160 1760 1760 1760 1760 1760 1160 116	286T 286T 326U 324T 284TS 284TS 324U 284T 284T 324T 324T 326T 286TS 286TS 286T 286T 326U 326T 326T 326T 326T 326T 326T 326T 326T	EM4102T M4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4104T M4104T M4104T M4104T M4104T M4104T M4104T M4104T M4107T M4109T EM4109T EM4110T	t. d. t. d.	2511 1882 2275 3150 1376 1378 1389 2426 1658 1285 1620 2376 2274 2259 3806 2078 1598 1912 2820 3425 2605 2598 2180	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1050M 1034M 1044M 1234M 1256M 1050M 1050M 1050M 1040M 1050M 1040M 1050M 1040M 1050M 1240M 1262M	441 466 493 529 280 396 447 359 388 458 548 520 586 417 413 436 380 418 498 584 565 563 523	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 93.0 88.5 94.1 90.2 91.0 92.4 93.0 92.4 93.0 93.0 88.5 94.5	<u></u>	150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 3525 3525 1760 1760 1160 1160 1160 1160 1200 1800 1200 1800 1200 1200 1200 120	445T 447T 447TS 447TS 447TS 447TS 447TS 449T 449T 5007L 449T 5009L 449T 5009L 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44157T-4 ECP4416T-4 M4416T-4 M4416T-4 ECP4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 ECP44206T-4 M44206T-4 M44206T-4 ECP44206T-4 ECP44206T-4 ECP50254L-2341 ECP50256L-2341 ECP44304T-4 ECP50306L-2341 ECP50306L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341	13129 14775 11398 15155 14947 12610 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 448510 35106 43190	B2 D2 B2 D2 B2 D2 B2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 18120M 18120M 18140M 1800M 18	1624 1850 1850 1850 2003 1753 2003	95.0 (94.5) (95.8) 96.2) 94.1 95.0 (95.8) (95.2) (95.2) (95.4) (95.4) (95.1) (95.1) (96.2) (95.2) (95.3)	G G G G G G G G G G G G G G G G G G G
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 3525 3525 3525 3525 1760 1760 1760 1180 1160 1760 1760 1760 1760 1760 1760 176	286T 286T 326U 324T 284TS 284TS 284TS 324U 284T 284T 324T 324T 326T 286TS 286T 286T 326U 326T 326T 326T 326T 326T 326T 326T 326T	EM4102T M4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T M4103T M4103T M4101 EM4108T M4108T EM4108T M4104T M4104T-9 M4104 EM4107T M4104T M4109T EM4109T EM4110T EM4100T EM4110T EM4100T EM4110T EM4100T	t. d. d. t. d. t.	2511 1882 2275 3150 1376 1378 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518 1912 2820 3425 2605 2598 2598 2598 2598 2598 2598 2695 2695 2695 2695 2796 2796 2796 2796 2796 2797 2797 2797	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1050M 1034M 1234M 1256M 1248M 1256M 1050M 1050M 1050M 1050M 1050M 1050M 1240M 1252M 1252M 1253M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418 498 584 565 563 523 560 490	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 93.0 92.4 93.0 90.2 91.0 92.4 93.0 90.2 93.0 90.2 91.0 90.2 90.2 90.2 90.2 90.2 90.2 90.2 90	<u></u>	150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 1760 1760 1160 1160 1160 1200 1800 1200 1800 1200 1200 1200 120	445T 447T 447TS 447TS 447TS 447TS 447TS 447T 449T 449T 5007L 449T 5009L 449T 5011L 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44157T-4 ECP4416T-4 M4416T-4 M4416T-4 ECP4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 ECP44206T-4 M44206T-4 M44208T-4 ECP44206T-4 ECP44206T-4 ECP50254L-2341 ECP50256L-2341 ECP44304T-4 ECP50306L-2341 ECP50306L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP5036L-2341 ECP5036L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 48510 35106 43190 51702	B2 D2 B2 D2 D2 B2 D2 D2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 1800	1624 1850 1850 1850 2003 1753 2003	95.0 (94.5) (95.8) (95.8) (95.8) (95.2) (95.2) (95.2) (95.4) (95.4) (95.1) (95.1) (96.2) (95.5)	
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 870 3525 1760 1760 1760 1760 1160 1160 3525 1760 1760 1160 1160 1160 1160 1160	286T 286T 326U 324T 284TS 284TS 284TS 324U 284T 284T 324T 324T 326T 286TS 286TS 286T 326U 326T 326T 326T 324T 324T 324T 324T 324T 324T 324T 324	EM4102T M4102T M4102T M4102 M4112T M4118T EM4107T M4107T M4103T M4103T M4103T-9 M4103 EM4111T M4111T M4116T EM4108T M4108T EM4104T M4104T-9 M4104 EM4117T EM4109T EM4109T EM4110T EM4308T M4108T	†* †* †* †* †* †* †* †* †* †*	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1969 1518 1912 2820 3425 2605 2598 2598 2574 2016 4610 3869	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1234M 1256M 1262M 1050M 1050M 1050M 1050M 1240M 1256M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418 498 584 563 563 523 560 490 785	91.7 88.5 90.2 88.5 91.0 93.0 93.0 93.6 89.5 93.6 89.5 93.0 92.4 93.0 90.2 91.0 92.4 93.0 93.0 93.0 93.0 93.0 93.0	<u></u>	150 150 150 200 200 200 200 200 200 250 250 250 2	1760 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 1160 1160 1200 1800 1200 1800 1200 1200 1800 1200 12	445T 447T 447TS 447TS 447TS 447TS 447T 447T 449T 449T 5007L 449T 5009L 449T 5011L 5011L 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44157T-4 ECP4416T-4 M4416T-4 M4416T-4 ECP4416T-4 ECP4416T-4 EM4407T-4 ECP4407T-4 ECP44206T-4 M4408T-4 ECP50254L-2341 ECP50304L-2341 ECP50306L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 48510 35106 43190 51702	B2 D2 B2 D2 D2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18120M 1800M 1800M 1800M 1800M 1800M 1800M 1800M N5007M 1800M N5007M 1800M N5011M N5011M N5011M N5011M N5011M N5011M	1624 1850 1850 1850 2003 1753 2003 2003	(95.8) (95.8) (95.8) (95.8) (95.8) (95.8) (95.2) (95.8) (95.4) (95.4) (95.1) (95.1) (95.5) (95.5)	
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 870 3525 1760 1760 1760 1160 3525 1760 1160 3525 1760 1160 3525 1760 1160 3525 1760 1160 3525	286T 286T 326U 324T 284TS 284TS 284TS 324U 284T 324T 324T 326T 286TS 286TS 286T 326T 326T 326T 326T 326T 326T 326T 32	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4107T M4103T M4103T-9 M4103 EM4111T M4111T M4116T EM4108T EM4104T M4104T-9 M4104 EM4117T EM4109T EM4110T EM4109T EM4110T EM4308T M4308T EM4308T EM4114T	t. d. t. d.	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1912 2820 3425 2605 2598 2180 2598 2180 369 375	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 E2 D2 D2 D2 D2 D2 E2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1034M 1248M 1256M 1050M 1050M 1050M 1050M 1240M 1256M	441 466 493 529 280 398 398 396 447 359 388 458 548 520 586 417 413 436 380 418 498 584 563 563 523 560 490 785 700	91.7 88.5 90.2 88.5 91.0 93.0 93.0 90.2 91.7 93.6 89.5 93.0 90.2 91.0 92.4 93.0 90.2 93.0 90.2 93.0 90.2 93.0 90.2 93.0 90.2	<u></u>	150 150 150 200 200 200 200 200 200 200 250 250 2	1760 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 1160 1160 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200	445T 447T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 5007L 449T 5009L 449T 5011L 5011L 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44157T-4 ECP4416T-4 M4416T-4 M4416T-4 M4407T-4 ECP4407T-4 EM4408T-4 ECP4408T-4 ECP44206T-4 ECP50256L-2341 ECP50306L-2341 ECP50306L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50456L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 40426 40510 43190 51702 45957 55745	B2 D2 B2 D2 D2 D2 B2 C2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18120M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M N5007M 1800M N5007M 1800M N5011M N5011M N5011M N5011M N5011M N5011M	1850 1850 1850 1850 2003 1753 2003 2003	(95.8) (95.8) (95.8) (95.8) (95.8) (95.8) (95.2) (95.8) (95.4) (95.1) (95.1) (95.1) (95.5) (95.5) (95.5) (95.5)	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 870 3525 1760 1760 1760 1760 1160 3525 3525 1760 1760 1160 3525 1760 1160 3525 1760 1160 3525 3525	286T 286T 326U 324T 284TS 284TS 284TS 284T 284T 324T 324T 326T 286TS 286T 286T 326T 326T 326T 326T 326T 324TS 324TS 324TS 324TS 324TS 324TS 324TS 324TS 324T 326T 326T 326T 326T 326T 326T 326T 326	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4107T M4103T M4103T-9 M4103 EM4111T M4111T M4116T EM4108T EM4104T M4104T-9 M4104 EM4117T M4107 EM4308T EM4107 EM4107 EM4108 EM4114T	t. t. t. t. t. t. t. t. t. t. t. t. t. t	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1912 2820 3425 2605 2598 2180 2598 2180 4610 3869 3375 2613	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1044M 1256M 1256M 1050M 1050M 1050M 1050M 1050M 1240M 1256M	441 466 493 529 280 398 392 396 447 359 388 458 548 520 586 417 413 436 380 418 498 565 563 523 560 490 785 700 625 578	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 90.2 91.7 93.6 89.5 93.0 88.5 94.1 90.2 91.0 92.4 93.0 90.2 93.0 88.5 94.1 90.2 93.0 88.5	<u></u>	150 150 150 200 200 200 200 200 200 200 250 250 2	1760 1160 1160 1160 3525 3525 3525 1760 1760 1160 1160 1160 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 5007L 449T 5009L 449T 5001L 5011L 5011L 5011L 5011L 5011L 5011L 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44155T-4 ECP44156T-4 EM4416T-4 M4416T-4 ECP4416T-4 EM4407T-4 EM4206T-4 ECP44206T-4 ECP44206T-4 ECP50256L-2341 ECP50306L-2341 ECP50306L-2341 ECP50356L-2341 ECP504404T-4 ECP5046L-2341 ECP50456L-2341	13129 14775 11398 15155 14947 12610 112900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 48510 51702 45957 55745	B2 D2 B2 D2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 1800M 18140M 1800M 1800M 1800M 1800M 1800M 1800M 1800M N5007M 1800M N5007M 1800M N5011M N5011M N5011M N5011M N5011M N5011M	1624 1850 1850 1850 2003 1753 2003 2003	(95.8) (95.8) (95.8) (95.8) (95.8) (95.2) (95.2) (95.8) (95.4) (95.4) (95.4) (95.5) (95.5) (95.5) (95.5) (95.5)	
20 20 20 25 25 25 25 25 25 25 25 25 25 25 25 25	1160 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 870 3525 1760 1760 1760 1160 3525 1760 1160 3525 1760 1160 3525 1760 1160 3525 1760 1160 3525	286T 286T 326U 324T 284TS 284TS 284TS 324U 284T 324T 324T 326T 286TS 286TS 286T 326T 326T 326T 326T 326T 326T 326T 32	EM4102T M4102T M4102T M4112T M4118T EM4107T M4107T M4107T M4103T M4103T-9 M4103 EM4111T M4111T M4116T EM4108T EM4104T M4104T-9 M4104 EM4117T EM4109T EM4110T EM4109T EM4110T EM4308T M4308T EM4308T EM4114T	t. d. t. d.	2511 1882 2275 3150 1376 1738 1389 2426 1658 1285 1620 2376 2974 2259 3806 2078 1598 1912 2820 3425 2605 2598 2180 2574 2016 4610 3869 3375 2613 2900	D2 B2 D2 D2 L2 B2 L2 D2 D2 D2 D2 D2 D2 E2 D2 D2 D2 D2 D2 E2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1060M 1050M 1240M 1250M 0946M 1044M 1032M 1232M 1050M 1034M 1248M 1256M 1050M 1050M 1050M 1050M 1240M 1256M	441 466 493 529 280 398 392 396 447 359 388 458 520 586 417 413 436 380 418 498 584 565 563 523 560 490 785 700 625	91.7 88.5 90.2 88.5 91.0 93.0 87.5 88.5 94.1 89.5 93.6 89.5 93.6 88.5 94.1 90.2 91.0 92.4 93.0 90.2 93.0 88.5 94.5 93.0 90.2 93.0 88.5	<u> </u>	150 150 150 200 200 200 200 200 200 200 250 250 2	1760 1160 1160 1160 3525 3525 3525 3525 1760 1760 1160 1160 1160 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200 1800 1200	445T 447T 447TS 447TS 447TS 447TS 447T 449T 449T 449T 5007L 449T 5009L 449T 5001L 5011L 5011L 5011L 5011L 5011L 5011L 5011L 5011L 5011L	ECP4406T-4 EM44156T-4 M44157T-4 ECP4416T-4 M4416T-4 M4416T-4 M4407T-4 ECP4407T-4 EM4408T-4 ECP4408T-4 ECP44206T-4 ECP50256L-2341 ECP50306L-2341 ECP50306L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50356L-2341 ECP50456L-2341	13129 14775 11398 15155 14947 12610 16770 12900 11318 14680 15510 13633 17600 15780 14491 18240 31405 22340 41277 24895 37660 28510 44894 40426 40426 40510 43190 51702 45957 55745	B2 D2 B2 D2 D2 B2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2 D2	1890M 18112M 1800M 1800M 1800M 1800M 1800M 18120M 18120M 1800M 1800M 1800M 1800M 1800M 1800M 1800M 1800M N5007M 1800M N5007M 1800M N5011M N5011M N5011M N5011M N5011M N5011M	1624 1850 1850 1850 2003 1753 2003 2003	(95.8) (95.8) (95.8) (95.8) (95.8) (95.8) (95.2) (95.8) (95.4) (95.1) (95.1) (95.1) (95.5) (95.5) (95.5) (95.5)	

SHADED RATINGS ARE CAST IRON FRAMES.



PERFORMANCE DATA (Standard Efficiency



Totally-Enclosed Fan-Cooled 3/60/230-460V (usable on 208V); 575V NEMA Design B and C, Class F Insulation , 40°C ambient, Continuous Duty, 1.15 S.F.



	T	l			FULL	LOAD		LOCKE	ROTOR	BREAK-			APPROX.
HP	FULL LOAD RPM	FRAME SIZE	LIST PRICE	TORQUE LB-FT	EFF.	P.F. %	CURRENT AMPS @460V	TORQUE WFLT	CURRENT AMPS @460V	DOWN TORQUE NFLT	ROTOR WR ² LB-FT ²	NEMA CODE LETTER	NET WT. LBS.
74	1150	1437	\$172	34	74 0	61.5	15	175 275	13	275 300	0 060	P	46
1	1750 1160	143T 145T	144 180	3 1 4 6	77.0 75.5	76.0 60.5	17	170	15	265	0 105	N N	50
11/2	3470 1720 1150	143T 145T 182T	148 160 192	23 46 69	80.0 77.0 75.5	86.0 78.5 77.5	2.2 2.3 2.6	175 250 165	20 20 20	250 260 250	0.050 0.085 0.200	M M	44 47 76
2	3460 1715 1160	145T 145T 184T	172 176 212	3 t 6 t 9 2	81 5 90 0 80.0	87.5 61.5 74.5	2 8 3.0 3.3	170 235 160	25 25 25	240 270 240	0.065 0.105 0.300	L L	46 50 88
3	3410 1750 1170	182T 182T 213T	202 196 266	4 6 9 1 13 5	78.5 84.0 85.5	90.5 79.5 74.5	4.1 4.2 4.7	160 215 155	32 32 32	230 250 230	0.125 0.220 0.360	K K	73 77 117
5	3460 1735 1155	184T 184T 215T	250 228 390	7 6 15 1 22 7	82.5 85.5 84.0	93 0 86 5 78 5	6.5 6.6 7.3	150 185 150	46 46 46	215 225 215	0.235 0.395 0.925	j j	90 103 160
77,	3475 1745 1170	213T 213T 254T	310 310 528	11 4 22 6 - 34 1	84 0 86 5 • 86 5	89 5 89 5 85 0	95 97 104	140 175 150	64 64 64	200 215 205	0 260 0 695 1 710	н н	143 143 211
10	3465 1745 1170	215T 215T 256T	362 374 652	15 3 30 3 45 3	85 5 87.5 87.5	90.5 90.5 84.5	12.4 12.6 13.5	135 165 150	81 81 81	200 200 200	0.380 0.955 2.550	н н	172 172 253
15	3510 1750 1165	254T 254T 284T	510 500 886	22 6 45 3 68 0	86.5 88.5 88.5	91.5 90.5 82.5	18.3 18.5 19.6	130 160 140	116 145 116	200 200 200	0.990 1.950 4.100	G G	246 255 323
20	3515 1750 1170	256T 256T 266T	650 626 1114	30.0 60.0 90.0	86.5 90.2 90.2	91.5 90.5 85.5	24.0 24.3 25.5	130 150 135	145 145 145	200 200 200	1.300 2.450 7.550	G G	297 308 440
25	3505 1750 1170	284TS 284T 324T	800 762 1332	38.0 75.0 112.0	96.5 90.2 91.7	91.0 88.5 82.5	29.7 30.2 31.3	130 150 135	183 183 183	200 200 200	1.600 3.750 6.700	G G	365 396 563
30	3520 1755 1170	266TS 266T 326T	946 898 1540	45.0 90.0 135.0	88.5 90.2 91.0	91.0 90.0 85.5	35.0 36.0 36.5	130 150 135	218 218 218	200 200 200	2.100 4.600 11.600	G G	433 451 435
40	3550 1760 1180	324TS 324T 364T	1245 1198 2060	61 0 120.0 180 0	89.5 91.0 92.4	89.0 90.0 85.0	47.0 47.5 49.5	125 140 135	290 290 290	200 200 200	3.000 6.700 15.600	G G	583 , 638 781
50	3545 1760 1175 875	326TS 326T 365T 405T	1662 1524 2428 3710	76 0 149 0 224 0 300 0	89.5 91.7 91.7 92.4	92.0 90.5 86.5 80.0	58.5 58.5 61.5 63.0	120 140 135 200	363 363 363 363	200 200 200 250	3.460 7.590 17.940 24.500	G G G	638 704 832 1034
60	3525 1765 1170 875	364TS 364T 404T 405T	2346 2348 2806 4302	89 0 179.0 269.0 360.0	89.0 93.0 93.0 92.4	94.0 87.5 84.0 80.0	69.0 71.0 72.0 76.0	120 140 200 200	435 435 435 435	200 200 250 250	5.450 10.800 23.100 30.000	G G	766 781 1056 1210
75	3540 1770 1170 880	365TS 365T 405T 444T	3026 2962 3372 5724	111.0 224.0 336.0 447.0	91.0 94.1 93.0 93.0	93.0 86.5 84.0 81.5	86.0 86.0 90.0 83.0	105 140 200 200	543 543 543 543	200 200 250 250	8.050 14.700 28.900 49.200	G G	836 847 1254 1540
100	3550 1770 1175 860	405T8 465T 445T 445T	4082 3746 4746 7240	148.0 296.0 447.0 596.0	93.0 93.0 93.0 93.0	89.5 87.5 85.5 82.5	112.0 115.0 118.0 122.0	105 200 200 200	725 725 725 725 725	200 250 250 250	10,900 25,000 50,700 64,000	G G G	1188 1309 1584 1782
125	3655 1775 1175 685	444TS 444T 445T 447TZ	5162 4836 6062 8176	185.0 370.0 558.0 741.0	93.0 93.6 93.6 93.6	90.2 87.5 85.5 82.5	140.0 115.0 146.0 152.0	100 200 200 200	908 908 908 908	200 250 250 250	16.000 37.900 62.000 66.400	G G G	1430 1540 1782 2244
150	3555 1775 1180 885	445TS 445T 447TZ 449TZ	6242 5504 7102 9634	221.0 443.0 667.0 889.0	93.6 93.6 93.6 93.6	90.2 87.5 85.5 82.5	167.0 171.0 176.0 182.0	100 200 200 200	1085 1085 1085 1085	200 250 250 250	19.000 45.500 45.500 99.400	G G G	1584 2156 1694 2530
200	3580 1785 1180 885	447TS 447TZ 449TZ 5007C	8782 7358 9646 12848	294.0 590.0 889.0 118.8	93.6 94.1 94.1 94.1	90.2 88.5 85.5 84.0	222.0 225.0 233.0 237.0	100 200 200 120	1450 1450 1450 1450	200 250 250 200	29.800 61.800 96.000 282.000	G G G	2112 2134 2508 3100
250	3580 1785 1180 885	449TS 449TZ 5007C 5009C	11410 9444 12028 14845	368 0 737 0 1113 0 1485 0	93.6 94.1 95.0 94.5	90.2 88.5 86.5 84.0	277.0 281.0 285.0 295.0	70 200 200 110	1825 1825 1825 1825	175 250 250 200	35.800 73.400 209.000 353.000	G G G	2486 2464 2900 3500
300	3580 1785 1185 885	5007A 5007C 5009C 5806B	19240 11158 17600 19484	440 0 883 0 1336 0 1782 0	94.5 95.0 95.0 94.5	91.0 89.5 86.5 84.0	327.0 331.0 342.0 353.0	85 200 200 100	2200 2200 2200 2200	210 250 250 200	55.000 129.000 237.000 502.000	G G G	2750 2900 2900 4400
350	3580 1785 1185 885	5009A 5009C 5806B 5806B	15922 13268 19712 21338	514 0 1030 0 1558.0 2078.0	94.5 95.0 95.0 94.5	91.0 90.2 87.5 84.0	381.0 382.0 394.0 413.0	85 200 200 100	2550 2550 2550 2550	210 250 250 200	66.000 154.000 420.000 585.000	G G G	3400 2560 3560 5100
400	3580 1785 1185	5808A 5806B 5808B	20288 14860 21064	587.0 1177.0 1782.0	94.5 95.0 95.0	91.7 90.2 87.5	432.0 437.0 451.0	80 200 200	2900 2900 2900	200 250 250	120.000 270.000 495.000	G G	4900 4200 5100
450 500	1785 1785	58068 58068	18500 20900	1325.0 1472.0	95.0 95.0	90.2 91.0	491.0 541.0	200	3250 3625	250 250	300.000 335.000	G	5100 5100

- 1. The above are typical values based on tast
- 2. Breakdown & locked rotor torque are shown as NEMA minimum value
- 3. Actual load & full voltage starting: According to ANSI / IEEE standard 112-1978 method B
- 4. 150HP and larger are 460V or 575V only.

5. Data subject to change without notice.

Performance Data MAX-E1™ Premium Efficiency, Type AEHE

Totally-Enclosed Fan-Cooled, 3/60/230-460V (usable on 208V); 575V NEMA Design B or Design C, Class F Insulation, 40°C ambient, Continuous Duty, 1.15 S.F.

			and a manual and section of the	a second more was	en a properties	yegene com	N. Y.		Thomas E		Control of the Contro		
	13114	TIME		CAR PT			clinos y		THE PARTY.	DOWNE	-1:01n:		建即。
es.	1115	Size	TO COU		् देशीश (१) विके		CHREAT AND AND AND AND AND AND AND AND AND AND	0.00		1080(13	3	21.12	
Princip Lane		44-10-604		and the second	5 00 O	61.0	1.4	175	12.5	275	0.105	P	5.00 E 3.00
0.750	1150	143T%	3.4	82.5 86.5	80.0	77.0 3	% 1.4 %;	275	15.0	300	0,105	N	
	1745 1150	₹ 145T	4.6	85.5	84.1 %. 82.7	60.0	1.8 %	170	15.0	265	0.124	<u> </u>	5.00 Sept.
	3480 1730	143T 145T 182T	2.3 4.6	85.5~~ 86.5	83.0 85.0	82.5 80.0 %	2.0 2.0 2.0	175 250	20.0 20.0	250 280	0.042 0.120	M M	300
20 CO. 5	1160		6.8	>> 86.5 ₹	85.4	-? 68.0 <i>m</i>	100 C475	165	20.0	250 240	0.317 0.051	M	
	3480 1730	145T 145T 184T	3.0 6.1	86.5 4 86.5 4 87.5 7	84.0 85.3 85.9	3 84.0 € 80.0 € 5 66.0 €	26% 27	170 235	25.0 25.0	270 270 240	0.139 0.392	Ĭ.	
	1165		9.0				3.2	160	25.0 32.0	230	0.196	ĸ	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
	3520 1750	¥ 182T → 182T → 213T	4.5 9.0	86.5 88.5 88.5	85.3 87.0 87.0	3 83.0 1 3 83.0 1 3 73.0 1	387	215 155	32.0 32.0	250 230	0.355 0.755	K	3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00
AND COLUMN TO	1165 3520	4 2131 E	13.5 7.5	. 00.0	# 87.7 FF	€ 86.0€	6.10	150	46.0	215	0.281	J	
	1750 1165	184T 184T 215T	15.0 22.5	* 89.5 89.5 89.5	87.7 88.1 87.5	83.0 S	6.1 6.1 7.1	185 150	46.0 46.0	225 215	0.504 1.073) J	
135 30 S	3525	213T	11.2	91.0	89.8	86.5	8.9	140	63.5	200	0.462 0.863	H	156 S 167
7.5	1755 1170	213T 254T	22.5 33.7	91.7 91.7	90.3 90.4	81.0 77.0	9.4 9.9	175 150	63.5 63.5	215 205	2.192	Ĥ	257.19
	3525	215T	14.9	91.0	89.7	88.0	11.7	135 165	81.0 81.0	200 200	0.592 1.140	H	183
210-	1755 1170	215T 256T	29.9 44.9	91.7 91.7	90.4 90.4	82.0 77.5	12.4 13.1	150	81.0	200	2.698	• н	189 ± 16 295 ±
	3540	5 254T (C)	22.3	91.7 92.4	*91.0 *91.6 *90.9*,	87.0 83.0 80.5	17.8 18.3 2	130 160	116.0 116.0	200 200	1.762 2.222	G	
	1760 1175	4 284T	44.8 67.1	91.7.24			#2 19.0 7	140	116.0	200	6.343	<u> </u>	74 A 14 T
	3540 1765	1,256T 256T	29.7 59.5	91.7 93.0 92.4	90.8 92.0 91.6	87.0 83.0 \$83.0	23.4	130 150	145.0 145.0	200 200	2.115 2.794	G	
	1175	7¥286T#X	89.4					135	145.0	200	8.073 2.595	G G	
	3545 1765	284TS 284T4 324T-3	37.1 74.4	93.0 93.0 93.0	92.4 92.4 92.4	2 86.0 A	27.6 %	130 150	182.5 182.5	200 200 200	4.507 10.546	Ğ	
	1175	3	112.0		2 92.4 2		M. 00 0 M	135 130	182.5 217.5	200	2,930	G	3.5
. CO.	3545 1765	286TS	44.5 89.3	93.0 93.6 93.6	92.7 92.7 92.5	*91.5 85.0 *83.0	9 35.3 36.1	150 135	217.5 217.5	200 200	5.138 12.554	Ğ	4763 597
Market .	1175 3540	3326T	134.0 59.4					125	290.0	200	3.528	G	8184
100	1770 1175	324TS 324T-5 364T	119.0 179.0	94.1 94.1 94.1	93.1 93.2 93.1	91.5 85.0 82.0	43.5 6 46.8 4 48.5	200 200	290.0 290.0	200 200	8.795 18.234	G	618 6644 898 7
30 TO	3540	326TS	74.0	94.17	≥ 93.0 %·	₩ 91.5 ¥	\$ 54.5°	120	362.5	200 200	4.270 10.325	G G	76936 7724
50	1770 1175	326T 365T *	148.0 224.0	94.1 94.1	93.2 93.1	86.0 83.0	58.0 60.0	200 200	362.5 362.5	200	21.740	Ğ	9118
	3535	⊇ 364TS	89.0	94.1	93.0 4 93.8 93.8 92.3	90.0 A	62.5	120 200	435.0 435.0	200 200	5.094 12.019	G	818 4 858 C
100	1775 1176	¥ 364T ¥ 404T.	178.0 268.0	94.5		₹ 82.3 美	73.0.25	200	435.0	220	33.300	G	1646
	3540 1770	#365TS 365T 2 405T ₩	111.0 223.0	94.1 94.5 93.7	# 93.5 T 93.9 T # 92.5 A	※ 90.0 位 ※ 87.0 年	83.0 85.5 91.04	105 200	542.5 542.5	200 200	6.020 15.024	G	800 8 02 02 0 02 02 0 02 02 0
	1177		335.0					200	545.0 725.0	220	42.400 13.800	G	40 120 K
	3560 1775	405TS 1 405TS 1 444AT	148.0 296.0	294.1 94.6 4 94.8	93.0 93.7 93.8 93.8	# 86.T	113.0 115.0 117.0	110 200	725.0 725.0 725.0	220 220	33.200 54.800	Ğ	
Sept State of the second	1180	A4ATSA	445.0 184.0	# 94.8 M	200	2 of 1 and	2138 AP	200 105	910.0	220	16.100	G	
	3564 1778	44415 4441 4451	369.0 557.0	94.94 1994.78 194.84	939	37.6	131.0	200 200	910.0 910.0	220 220	42.200 70.700	G	1810
STATE SA	1180 3568	MASTS .	221.0	95.0 E	64 94 KH		\$164.05€	105	1085.0	210	21.200	G	1060
	1780 1182	445TS 3445T 447TZ	443.0 667.0	94.7% 95.0	94 (3) 93.9 2 94.1		771.0	200 200	1085.0 1085.0	210 210	49.700 107.00	Ğ	2215
	3580	1.7447TS 1	294.0	15 17:		200 - 10	215.0 % 221.0 % 233.0 %	100	1450.0 1450.0	210 210	34.300 74.000	G G	2220
2007	1785 1185	447TZ 3 449TZ	589.0 887.0	95.5 95.1	94.5 94.6 94.2	91.3 88.7 84.5	233.0	200 200	1450.0	210	129.000	G	2685減
250	3583	449TS	367.0	95.4	94.5	91.2	269.0 275.0	100 200	1825.0 1825.0	210 210	43.100 87.700	G G	2620 2 4-2720 4
Someth,	1786	449TZ	736.0	95.5	94.6	- 89.1 €	270.0 %	200	,,020.0				111

Note:

- 1. The above are typical values based on test.
- 2. Actual load and full voltage starting: According to ANSI/IEEE standard 112-1978 method B.
- 3. Minimum guaranteed efficiency values can be certified with actual tests.
- 4. Breakdown and locked rotor torque are shown as NEMA minimum values.
- 5. 150 HP and above are 460V only.
- 6. Data subject to change without notice.

t M C E 18. Inc. EMC#12197000 MEIP, Ft. Hood DACA 63-92-C-0152

	PREA	AIUM EFFIC	PREMIUM EFFICIENCY MOTOR EFFICIENCY	OR EFFICIE	NCY	-77	STANDARD EFFICIENCY MOTOR EFFICIENCY	EFFICIENC	Y MOTOR E	FFICIENCY		PREM	PREMIUM EFFICIENCY MOTOR COSTS	JENCY M	OTOR CC	STS			BASE (5)	TOTAL
웊	S	ε	3	ල	€	AVG	ε	(2)	(3)	(4)	AVG	ε	(2)	(3)	(4)	AVG	HANDLE	INSTALL	LABOR	COST (6)
						1,384					1,384					1,384	(hrs)	(hrs)	(\$)	(\$)
0.	85.5%	86.5%	78.5%	86.5%	85.5%	86.2%	78.5%	78.5%	77.0%	77.0%	77.5%	\$319	_	\$362	-	\$359	2.00	1.78	\$64	\$795
5,	85.5%	86.5%	81.5%	86.5%	85.5%	86.2%	77.0%	81.5%	77.0%	78.5%	77.5%	\$354		\$402		\$389	2.50	1.78	\$107	\$869
2.0	85.5%	86.5%	83.5%	86.5%	86.5%	86.5%	80.0%	81.5%	80.0%	82.5%	80.8%	\$387		\$442		\$420	2.67	1.78	\$111	\$931
3.0	88.5%	88.5%	85.5%	88.5%	89.5%	88.8%	84.0%	85.5%	84.0%	81.5%	83.2%	\$429		\$490		\$457	3.50	1.78	\$132	\$1,032
6.0	88.5%	89.5%	85.5%	89.5%	90.2%	89.7%	86.0%	85.5%	85.5%	84.0%	85.2%	\$502		\$678		\$553	8.7	1.78	\$149	\$1,231
7.5	%0.0%	91.7%	87.5%	91.7%	90.19	91.5%	87.0%	86.5%	86.5%	85.5%	86.3%	\$685	_	\$776	-	\$704	5.33	5:	\$181	\$1,552
2	%0.0%	91.7%	89.5%	21.7%	91.7%	21.7%	87.5%	87.5%	87.5%	87.5%	87.5%	\$825	_	\$815		16/5	6.67	500	\$216	\$1,767
15	8016	92.4%	91.0%	92.4%	92.4%	92.4%	80.0%	88.5%	88.5%	87.5%	88.3%	\$1,088		\$1,232		\$1,122	8.0	2.50	\$262	\$2,428
8	92.0%	93.0%	91.7%	93.0%	93.0%	93.0%	89.5%	87.5%	90.2%	88.5%	89.4%	\$1,368		\$1,635		\$1,390	10.67	3.08	\$343	\$3,040
52	92.0%	93.0%	93.0%	93.0%	94.1%	93.4%	\$2.0	90.2%	90.2%	89.5%	\$0.0%	\$1,610	\$2,000	\$1,828	\$1,658	\$1,699	11.40	3.20	\$364	\$3,619
30	92.0%	93.6%	93.0%	93.6%	94.1%	93.8%	%9.06 %	90.0%	%7.06	90.2%	90.3%	\$1,874	\$2,325	\$2,125	-	\$1,989	13.30	3.33	\$415	\$4,218
9	92.0%	94.1%	93.6%	94.1%	94.5%	94.2%	20.19	×.2	91.0%	9.0%	90.0%	\$2,486	\$3,105	\$2,823	\$2,574	\$2,628	16.00	4.00	\$400	\$5,486
8	92.5%	94.1%	94.1%	94.1%	95.0%	94.4%	92.0%	<u>ج</u> پر	۶ پر	×.2	91.8%	\$3,063	\$3,812	\$3,467	\$2,900	\$3,140	17.78	200	\$208	\$6,506
8	92.5%	94.5%	94.1%	94.5%	95.0%	94.7%	92.4%	90.09	93.0%	92.4%	92.6%	\$4,374	\$6,472	\$4.974	\$4,601	\$4,616	19.00	5.71	\$617	\$9,181
75	92.5%	94.5%	94.5%	94.5%	95.0%	94.7%	93.6%	93.0%	94.1%	92.4%	93.4%	\$5,548	\$6,936	\$6,305	\$5,260	\$5,704	20.00	6.67	\$99\$	\$11,176
9	93.5%	94.6%	95.0%	94.6%	95.0%	94.7%	93.0%	21.7%	93.0%	93.0%	93.0%	\$6,860	\$8,572	\$7,790	\$7,180	\$7,277	24.00	8.89	\$821	\$14.207
	Totally enc	losed, fan c	Totally enclosed, fan cooled, squirrel cage	rrel cage								(5) Labor	Labor cost for el	ectrician	from Mea	electrician from Means Electrical Cost	al Cost De	Data 1993 Is	\$24.95/hr.	
	(1) Westl	(1) Westinghouse Optim HE	otim HE									(6) Includ	es 10% sl	te & locat	ion factor,	16% ove	rhead, 10%	6 profit, and	Includes 10% site & location factor, 16% overhead, 10% profit, and 25% contingency	gency.
												:			•					

Totally enclosed, fan cooled, squirrel cage
(1) Westinghouse Optim HE
(2) Magnetek Louis Aliis Spartan
(3) TECO Max-E1
(4) Baldor Super-E

	O WAD	JPW Discount Factors (1)	Hors (1)	
Energy Type	Unit Energy Rossunt rate = 4%, Region 3	rate = 4%,	Region 3	
Economic Life of ECO (yrs)		01	15	&
Electric Energy	0.024402 (\$/kWh)	8.39	11.77	14.65
Electric Demand	152.67 (\$/kW)	8.39	11.77	14.65
Natural Gas	4.035 (\$/MBhu)	10.01	16.34	20.6
Central Plant Hot Water	5.38 (\$/MBfu)	10.01	16.34	200
Central Plant Chilled Water	4.067 (\$/MBlu)	8.39	- 11.77	14.65
Annual Recurring Non-Energy Savings		8.11	1.12	13.59

(1) NISTIR 85-3273-7 EDnergy Prices and Discount Factors for Life-Cycle Cost Analysis 1993

.108		
	•	

FIGURE TWO A COST () is the light of the periodic form of the contract of th

E M C ENGINEERS, INC. Denver • Atlanta • Germany

MOTOR SURVEY

	era ala ala a		3 3 9 3 3		2 3 2 7 8			
BLOG.	MOTOR APPLICATION	HP	MANUFACTURER	Volts	Amps	CONTROL HIGHLY	SET PTS LOW(F)	HRS/ YEAR
P- 1950	Secondary CW/HWAmp	3.0	Westinghouse	208-230/ 460	9.2/4.6	70	65	8029
P-2070	i i i	2.0	ESTIMATEO - NO NAMEPLATE			65	50	6475
P-2153	μ ;	3.0	Leland- Faraday	208-220/ 440	9.0-8.8/ 4.4	65	<i>5</i> 5	7206
P-2250	11	3.0	Baldor	208-220/ -440-	8.4-8.0 ₁ 4.0	70	70 -	8760
P-1951	1	5.0	Marathon (Federal pump- 1128 gpm at 31 H.H	208-220/ 440	13.01	-65	60	7947
P-1952	H 	5.0	Marathon	208-230, 460	14.8-15A, 7.7	70	65	8029
P-1953	1/	1.5	Marathon	208-220/ 440	4.8/2.4	70	65	8029
P-1954	N	(ES.O.	Marathon	208-220/ 	13.0/	65	55	7206
P-2050	:	5.0	Marathon	И		70	62	8029
P-2051	h	5.0	Marathon	и	И	65	55	7206
P-205Z	ц	1.5	Baldon	208-230/ 440	372-48/ 2.4	70	65	8029
P-2054	11	Moto	nis in repair HVAC No. 21P/			70	60	7216
P-2071	И	2.0	Marathon	208-220/ 440	6.4/ 3.2	65	60	7947
P-2072	N	5.0	Marathon	208-220/ 440	13.0/	65	55	7206
P-2073	W	5.0	Marathon	11	11	45	45	8760
P-2074	И	1.5	Baldon	208-230/ 460	5.2-4.8/ 2.4	68 70	50	5744

JOB	
SHEET NO.	OF
CALCULATED BY	DATE
CHECKED BY	DATE

E M C ENGINEERS, INC.

Denver • Atlanta • Germany

MOTOR SURVEY

	1122411				<u> </u>		
BLDG. No.	MOTOR APPLICATION	ΗР	MANUFACTURER	VOLTS	Amps	CONTROL SETPE HIGH (F) LOW (F)	HRS YEAR
P-2150	Secondary)	ESTIMATED- NO NAMEPLATE			75 60	6696
P-2151	.	5.0	Baldsr	208-230/ 460	13.1-11.5/ 5.7	65 65	8760
P-2152	h	5.0	Marathon	208-230/ 460	14.0-1409 7.0	65 60	7941
P-2154	И	5.0	Balder High Efficiency	208-230/ 460	/3.1-//.s/ 5.7	65 55	7206
P-2251	H	5.0	Baldor	I		75 65	75.09
P-2252	H .	5.0	Marathon	208-270/ 440	13.0/	80 60	6284
P-2253	11	5.0	Marathon	н	И	Control is disabled.	8 760
P-2254	1 + H + + 1	5.0	U.S. Electric	230/460	12.8/6.4	65 65	8760
P-2450	И	5.0	Reliance	<i>20</i> 0	16.1		8240
P-2451	И	5.0	Reliance	Z <i>0</i> 0	16.1		ц
P-2452	h	3,0	General Electric	230/ 460	9.2/ 4.6		11
P-2453	И	5.0	Reliance	200	16.1) į
P-2454	ħ	5.0	Reliance	200	16.1		ţ1
	AHU	10.0	Century 6-330779-02	200/208	29.0/ 29.0	. ——	8760
P-2350	HW Pump	1.0	Century H258	208-230/ 460	3.4-3.4/ 1.7		6577
	CM Forme	1.5	Wagnen	220/ 440 C1-35	4.8/		2183

JOB	<u> </u>
SHEET NO.	OF
CALCULATED BY	DATE
CHECKED BY	. DATE

E M C ENGINEERS, INC.

Denver • Atlanta • Germany

MOTOR SURVEY

<u> </u>	<u> </u>) · · · · · · · · · · · · · · · · · · ·				
BLOG.	MOTOR APPLICATION	НР	MANUFACTURER	VOLTS	Amps	CONTROL SET PTS. HIGH (F) LOW(F)	HRS
P-1853	AHU-1	10.0	Marathon	200	31.0		8760
	AHU-2	5.0	U.S. Electric	200	16.6		\0.4.m2 £ .6′
	HW Pump HW Pump=2	5.0 0.5	Marathon	208-22d 440	13.0/ 6.5		6577 Not usted
	CW Pump	1.0	Baldon High Efficiency	208-230/ 460	3.6-3.4/ 1. 7		Z183
P-2060	AHU-1	7.5	Century	Z00 -20 8	Z3.0-Z3.0	: :	8760
:	AHU-2	5.0	Century.	200-208	16.0-16.0		Notused
	HWpump Hwpump 122	5,0 0.33	Marathani (Ocyton)	208-220/ 440	13.0/6.5		6577 Notused
	CWpump	1.5	Marathon	208 - 226 / 440	4.8/ 2.4		2183
P-2160	AHU-1	7.5	Century	200-208	23.0-23.0		8760
1-2160	AHU-2	3.0	AJAX Elect.	230/460	9.0/4.5		Nor Used
	HWPUNP	1.5	Baldsr	208-220/ 440	4.6-4.2		6577
	HWgump#2	1.0	Bell & Gasset	230/460	4.6/2.3		NOT USED
	CNAmp	1.5	Marathon	208-220/ 440	4.8/2.4		2183
P-2352	AHU	10.0	Century	Z00 -208	29.0-29.0		8760
	HWPump	0.75	Baldor	208-2301 460	32-30/ 1.5		6577
	CWPump	1.5	Wagner	208-220/ 440	4.8-48/ 2.4		2183
P-2700	Ани	10.0	U.S. Elec. Notor	230/460	27.4/13.7		8760
	R.A. Fan	3.0	Century-Good	200-208	10,4-10.4	4	8760
	HW Pump	3.0	U.S. Elec. Mator	200	100		6577
	(Stantiby)	T	и	. n	и		
	CW Pump	3.0	и	200	10.0		2183
			· · · · · · · · · · · · · · · · · · ·				•

AND STORE NEEDS IN THE WORLD DEFENDED IN THE HEAD

TAB C-2 FORT CARSON NIGHT SETBACK THERMOSTAT ECO #14

							•	
	LOCATION: FORT	CARSON, COLO	PRADO	REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE				FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO #14 - NIGHT	T SETBACK THEF	RMOSTAT		BUILDING NO.:	P-1007
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	: 15		PREPARED BY:	A. NIEMEYER
1 181	VESTMENT COSTS							
	CONSTRUCTION COST						£1 00E	
	SIOH COST		= (5.5% of 1A) =				\$1,005 \$55	
	DESIGN COST		(6.0% of 1A) =				\$60	
	TOTAL COST		(1A + 1B + 1C) =				\$1,120	
E.	SALVAGE VALUE		=				\$0	
F.	SALVAGE VALUE OF EX	(ISTING EQUIP.	=				\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =				>	\$1,120
			,			·		•
2 EN	IERGY SAVINGS (+) or	COST (-)						
	TE OF NISTIR 85-3273-X (* *	NT FACTORS: C	CTORER 1992				
	ENERGY	COST	SAVINGS			DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	•		FACTOR (4)	SAVINGS (5)	
A.	ELEC & DEMAND	\$17.14	22.00	• • •		11.70	\$4,412	
8.	DIST			\$0		13.78	\$0	
C.	NAT GAS	\$3.48	331.00	\$1,151		14.16	\$16,292	
D.	COAL			\$0		11.57	\$0	
E.	SOLAR			\$0			\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0		11.12	\$0	
G.	TOTAL		353.00	\$1,528			>	\$20,704
3 NC	NENERGY SAVINGS ((+) or COST (-)						
A.	ANNUAL RECURRING						\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =		11.12		
	2 DISCOUNTED SAVING	S or COST		(3A x 3A1) =			\$0	
B	NONRECURRING							
J.	ITEM		SAVINGS or	YEAR OF		DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)			SVGS or COST (4)	
	a,		\$0	• •		0.00	\$0	
	b.		\$0			0.00	\$0	
	c.		\$0			0.00	\$0	
	d TOTAL		\$0				\$0	
C.	TOTAL NONENERGY DIS	SCOUNTED SAVING	S or COST		(3,	A2 + 3Bd4) =		\$0
4 SII	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A +	(3Bd1/15)) =		0.7
5 TC	TAL NET DISCOUNTE			(2G5 + 3C) =		\$20,704		
6 SA	VINGS-TO-INVESTME			(5/1G) =		18.48		
7 AC	JUSTED INTERNAL RA	ATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power	- 1] x 100 =		26.32

	LOCATION: FO	ORT CARSON, COLO	RADO	REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE				FISCAL YEAR:	1992
	DISCRETE PORTI	ON NAME: E	CO #14 - NIGH	T SETBACK THER	MOSTAT		BUILDING NO.:	P-1955
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	:: 15		PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS							
	CONSTRUCTION CO		=				\$335	
В.	SIOH COST		(5.5% of 1A) =				\$18	
C.	DESIGN COST		(6.0% of 1A) =				\$20	
D.	TOTAL COST		(1A + 1B + 1C) =				\$373	
E.	SALVAGE VALUE		=				\$0	
F.	SALVAGE VALUE OF	EXISTING EQUIP.	=				\$0	
G.	TOTAL INVESTMENT	p	(1D - 1E - 1F) =				>	\$373
2 EN	IERGY SAVINGS (+)	or COST (-)						
		-X USED FOR DISCOU	NT FACTORS: 0	CTOBER 1992				
	ENERGY	COST	SAVINGS			DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	•	1	FACTOR (4)		
A.	ELEC	\$7.32	· · · · · · · · · · · · · · · · · · ·	\$0	•	11.70	\$0	
В.	DIST		0	•		13.78	\$0	
C.	NAT GAS	\$3.48	160	•		14.16	•	
D.	COAL		0	\$0		11.57	\$0	
E.	SOLAR			\$0			\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0		11.12	\$0	
G.	TOTAL		160	\$557			·>	\$7,884
3 NO	NENERGY SAVING	S (+) or COST (-)						
A.	ANNUAL RECURRING	3					\$0	
	1 DISCOUNT FACTO	R		(From Table A-2) =		11.12		
	2 DISCOUNTED SAV	INGS or COST		(3A x 3A1) =			\$0	
В.	NONRECURRING							
	ITEM		SAVINGS or	YEAR OF		DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)			SVGS or COST (4)	
	a .		\$0	0	,	0.00	\$0	
	b.		\$0	0		0.00	\$0	
	c,		\$0	0		0.00	\$0	
	d TOTAL		\$0				\$0	
C.	TOTAL NONENERGY	DISCOUNTED SAVING	S or COST		(3A	2 + 3Bd4) =	30	\$0
					•	ŕ		
4 SIM	MPLE PAYBACK (SP	B) - (YRS)		1G/(2	:G3 + 3A + (3	3Bd1/15)) =		0.7
	TAL NET DISCOUN	* *		. 447 (44		(G5 + 3C) =		\$7,884
	VINGS-TO-INVESTI				,-	(5/1G) =		21.12
		RATE OF RETURN (AIRR) . (%)	[/1 + O4) v CID +- 4	/4E no			
· max	1 1141 1140-	MILO REIGHN	VIUU) . (20)	((1+.04) x SIR to 1	/ 15 power - 1	ij x 100 =		27.45

	LOCATION TOTAL							
		RT CARSON, COL		REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE	AP UPDATE				FISCAL YEAR:	1992
	DISCRETE PORTIO	N NAME:	ECO #14 - NIGHT	T SETBACK THEF	RMOSTAT		BUILDING NO .:	P-1956
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	: 15		PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS							
A.	CONSTRUCTION COS	т	=				\$335	
В.	SIOH COST		(5.5% of 1A) =				\$18	
C.	DESIGN COST		(6.0% of 1A) =				\$20	
D.	TOTAL COST		(1A + 1B + 1C) =				\$373	
E.	SALVAGE VALUE		=				\$0	
F.	SALVAGE VALUE OF E	EXISTING EQUIP.	=				\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =				>	\$373
2 EN	IERGY SAVINGS (+)	or COST (-)						
	TE OF NISTIR 85-3273-X	• •	UNT FACTORS: C	CTOBER 1992				
	ENERGY	COST	SAVINGS	ANNUAL \$	DISC	COUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)			OR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0		11.70	\$0	
В.	DIST		0	\$0		13.78	\$0	
C.	NAT GAS	\$3.48	160	\$557		14.16	\$7,884	
D.	COAL		0	\$0		11.57	\$0	
E.	SOLAR			\$0			\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0		11.12	\$0	
G.	TOTAL		160	\$557			>	\$7,884
3 NC	NENERGY SAVINGS	(+) or COST (-)						
	ANNUAL RECURRING						\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =		11.12	45	
	2 DISCOUNTED SAVIN	IGS or COST		(3A x 3A1) =		• • • • •	\$0	
_				` ,				
В.	NONRECURRING							
	ITEM		SAVINGS or	YEAR OF		TNUO	DISCOUNTED	
				OCCURRENCE (2)	FACT		SVGS or COST (4)	
	a.		\$0	0		0.00	\$0	
	b .		\$0			0.00	\$0	
	c. d TOTAL		\$0	. 0		0.00	\$0	
_	TOTAL NONENERGY D	NECOLINITED CAVIN	\$0				\$0	
0.	TOTAL NONENERGY D	DISCOUNTED SAVIN	igs or COST		(3A2 + 3	Bd4) =		\$0
4 SIN	MPLE PAYBACK (SPB) - (YRS)		1G//	2G3 + 3A + (3Bd1)	/15)) =		0.7
	TAL NET DISCOUNTI	1G/(2G3 + 3A + (3Bd1/15)) = (2G5 + 3C) =						
	VINGS-TO-INVESTME				•	•		\$7,884
			I (AIDD) (6()	*** ***	•	/1G) =		21.12
, AD	JUSTED INTERNAL F	WIE OF HEIURN	i (AIHH) - (%)	[(1+.04) x SIR to 1/15 power - 1] x 100 =				27.45

	LOCATION: FORT	CARSON, COLO	PRADO	REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE				FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO #14 - NIGH	T SETBACK THER	MOSTAT		BUILDING NO.:	P-2055
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	:15		PREPARED BY:	A. NIEMEYER
		5 1,7 1,00					,	7.1
1 IM	VESTMENT COSTS							
	CONSTRUCTION COST		_				\$335	
	SIOH COST		= (5.5% of 1A) =				\$18	
	DESIGN COST		(6.0% of 1A) =				\$20	
	TOTAL COST		(1A + 1B + 1C) =				\$ 373	
	SALVAGE VALUE		=				\$0	
	SALVAGE VALUE OF EX	ISTING FOUIP	-				\$0	
	TOTAL INVESTMENT		(1D - 1E - 1F) =				·	\$373
			(13 12 11)				_	, 40.0
2 FN	IERGY SAVINGS (+) or	COST (J						
	TE OF NISTIR 85-3273-X U		NT FACTORS: C	OCTOBER 1992				
-	ENERGY	COST	SAVINGS			DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)			FACTOR (4)		
A.	ELEC	\$7.32		\$0	•	11.70	• •	
В.	DIST	******	o			13.78	•	
C.	NAT GAS	\$3.48	65	• -		14.16		
D.	COAL		0	\$0		11.57	\$0	
E.	SOLAR			\$0			\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0		11.12	\$0	
G.	TOTAL	•	65	227.6			>	\$3,223
3 NC	NENERGY SAVINGS (-	+) or COST (-)						
A.	ANNUAL RECURRING						\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =		11.12		
	2 DISCOUNTED SAVING	iS or COST		$(3A \times 3A1) =$			· \$0	
В.	NONRECURRING							
	ПЕМ		SAVINGS or	YEAR OF		DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	F	FACTOR (3)	SVGS or COST (4)	
	a.		\$0	0		0.00	\$0	
	b.		\$0	0		0.00	\$0	
	C.		. \$0	0		0.00	\$0	
	d TOTAL		\$0				\$0	
C.	TOTAL NONENERGY DIS	SCOUNTED SAVING	S or COST		(3A	2 + 3Bd4) =	,	\$0
	MPLE PAYBACK (SPB)	1G/(2	2G3 + 3A + (3Bd1/15)) =		1.6		
5 TO	TAL NET DISCOUNTED		(2	2G5 + 3C) =		\$3,223		
6 SA	VINGS-TO-INVESTMEN		(5/1 G) =			8.63		
7 AD	JUSTED INTERNAL RA	[(1÷.04) x SIR to 1/15 power - 1] x 100 =				20.07		

	LOCATION: FOR	T CARSON CO	OBADO	DECION:	•		550 1507 110	
	· -	IT CARSON, COI		REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE					FISCAL YEAR:	1992
	DISCRETE PORTIO	N NAME:	ECO #14 - NIGH	T SETBACK THEF	RMOSTAT		BUILDING NO.:	P-2056
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	: 15		PREPARED BY:	A. NIEMEYER
	VESTMENT COSTS							
	CONSTRUCTION COS	Τ	=				\$335	
	SIOH COST		(5.5% of 1A) =				\$18	
	DESIGN COST		(6.0% of 1A) =				\$20	
	TOTAL COST		(1A + 1B + 1C) =				\$373	
	SALVAGE VALUE		=				\$0	
	SALVAGE VALUE OF E	EXISTING EQUIP.	=				\$0	
G.	TOTAL INVESTMENT	•	(1D - 1E - 1F) =				>	\$373
٥.5	IEDOVIO ANTINOS ()							
	IERGY SAVINGS (+)	• • •	•					
DA	TE OF NISTIR 85-3273->							
	ENERGY	COST	SAVINGS				DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)				SAVINGS (5)	
	ELEC	\$7.32	_	\$0	·	1.70	\$0	
	DIST	20.40	0	•-		3.78	\$0	
	NAT GAS COAL	\$3.48	160	****		4.16	\$7,884	
			0	\$0	1	1.57	\$0	
-	SOLAR	***		\$0			\$0	
	DEMAND SAVINGS TOTAL	\$69.68 / year	455	\$0	1	1.12	\$0	
G.	IOIAL		160	\$557			>	\$7,884
3 NC	NENERGY SAVINGS	(+) or COST (-)						
	ANNUAL RECURRING	(,,), (,					**	
	1 DISCOUNT FACTOR			(From Table A-2) =	4	1.12	\$0	
	2 DISCOUNTED SAVIN			(3A x 3A1) =	•	1.12	\$0	
				(00 x 001) =			φ0	
В.	NONRECURRING							
	ITEM		SAVINGS or	YEAR OF	DISCO	UNT	DISCOUNTED	
				OCCURRENCE (2)	FACTO	R (3)	SVGS or COST (4)	
	a.		\$0	0	(0.00	\$0	
	b.		\$0	0	•	0.00	\$0	
	c.		\$0	0	(0.00	\$0	•
_	d TOTAL		\$0				\$0	
C.	TOTAL NONENERGY D	DISCOUNTED SAVIN	IGS or COST		(3A2 + 3Bc	14) =		\$0
4 SIN	MPLE PAYBACK (SPB) - (YRS)		40.0	0G2 , 2A , 72B-444	=11		A =
	TAL NET DISCOUNT	16/(1G/(2G3 + 3A + (3Bd1/15)) =			0.7		
	VINGS-TO-INVESTME		(2G5 + 3	G) =		\$7,884		
	JUSTED INTERNAL F	, ,	N (AIRR) - (%)	[(1+ 04) v SID to	ری 1/15 power - 1] x 100	-		21.12
	· · · · · · · · · · · · · · · · · · ·	: -:	· · · · · · · · · · · · · · · · · · ·	[(·········) × • ··· · · · · ·	., . o ponoi - 1] X 100	<i>,</i>		27.45

							•	(
	LOCATION: F	ORT CARSON, CO	LORADO	REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON E	EAP UPDATE				FISCAL YEAR:	1992
	DISCRETE PORT	TON NAME:	ECO #14 - NIGH	T SETBACK THEF	RMOSTAT		BUILDING NO.:	P-2155
	ANALYSIS DATE:	: 04/14/93		ECONOMIC LIFE	: 15		PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS	3						
	CONSTRUCTION C		_				\$335	
	SIOH COST	-	(5.5% of 1A) =				\$18	
C.	DESIGN COST		(6.0% of 1A) =				\$20	
D.	TOTAL COST		(1A + 1B + 1C) =				\$373	
E.	SALVAGE VALUE		=				\$0	
F.	SALVAGE VALUE O	F EXISTING EQUIP.	=				\$0	
G.	TOTAL INVESTMEN	IT	(1D - 1E - 1F) =				·····>	\$373
2 EN	IERGY SAVINGS (-	+) or COST (-)						
DA	TE OF NISTIR 85-327	3-X USED FOR DISC	OUNT FACTORS: (OCTOBER 1992				
	ENERGY	COST	SAVINGS	ANNUAL \$		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)		FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0		11.70	\$0	
В.	DIST		0	\$0		13.78	\$0	
	NAT GAS	\$3.48	160	\$557		14.16	\$7,884	
-	COAL		0	\$0		11.57	\$0	
	SOLAR			\$0			\$0	,
	DEMAND SAVINGS	\$69.68 / year		\$0		11.12	\$0	,
G.	TOTAL		160	\$557			>	\$7,884
3 NC	NENERGY SAVING	GS (+) or COST (-)						
A.	ANNUAL RECURRIN	NG					\$0	
	1 DISCOUNT FACT			(From Table A-2) =		11.12		
	2 DISCOUNTED SA	VINGS or COST		(3A x 3A1) =			\$0	
В.	NONRECURRING							
	ITEM		SAVINGS or			DISCOUNT	DISCOUNTED	
	_			OCCURRENCE (2)			SVGS or COST (4)	
	a.			0		0.00		
	b.		\$0	0		0.00	\$0	
	C.		\$0	0		0.00	\$0	
_	d TOTAL	V DISCOUNTED SAV	0\$ TROS 200T		10.1		\$0	
U.	TOTAL NUNENERG	Y DISCOUNTED SAV	INGS OF COST		(34	\2 + 3Bd4) =		\$0
4 SIN	MPLE PAYBACK (S	PB) - (YRS)		1G/(2G3 + 3A + ((3Bd1/15)) =		0.7
5 TO	TAL NET DISCOUN	NTED SĄVINGS			(2G5 ÷ 3C) =		\$7,884
		MENT RATIO (SIR				(5/1G) =		21.12
7 AD	JUSTED INTERNA	L RATE OF RETUR	IN (AIRR) - (%)	[(1+.04) x SIR to 1/15 power - 1] x 100 =				27.45

	LOCATION: FO	ORT CARSON, COLO	DRADO	REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	AP UPDATE				FISCAL YEAR:	1992
	DISCRETE PORTI	ON NAME: E	CO #14 - NIGHT	SETBACK THEF	RMOSTAT		BUILDING NO .:	P-2156
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	: 15		PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS							
	CONSTRUCTION CO		=				\$335	
	SIOH COST	,01	- = (5.5% of 1A)				\$33 \$18	
	DESIGN COST		(6.0% of 1A) =				\$20	
	TOTAL COST		(1A + 1B + 1C) =				\$373	
E.	SALVAGE VALUE						\$0	
F.	SALVAGE VALUE OF	EXISTING EQUIP.	*				\$0	
G.	TOTAL INVESTMENT	г	(1D - 1E - 1F) =				>	\$373
2 EN	IERGY SAVINGS (+	or COST (-)						
		-X USED FOR DISCOL	INT FACTORS: C	CTORED 1992				
	ENERGY	COST	SAVINGS			DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	•		FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0		11.70	\$0	
В.	DIST		0	\$0		13.78	\$0	
C.	NAT GAS	\$3.48	160	\$557		14.16	\$7,884	
D.	COAL		0	\$0		11.57	\$0	
E.	SOLAR			\$0			\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0		11.12	\$0	
G.	TOTAL		160	\$557			>	\$7,884
3 NC	NENERGY SAVING	is (+) or COST (-)						
A.	ANNUAL RECURRIN	G					\$0	
	1 DISCOUNT FACTO	OR .		(From Table A-2) =		11.12		
	2 DISCOUNTED SAY	/INGS or COST		(3A x 3A1) =			\$0	
В	NONRECURRING							
٠.	ITEM		SAVINGS or	YEAR OF		DISCOUNT	DISCOUNTED	
			•	OCCURRENCE (2)			SVGS or COST (4)	
	a.		\$0	0.000		0.00	\$0	
	b.		\$0	0		0.00	\$0	
	c.·		\$0	0		0.00	\$0	
	d TOTAL		\$0				\$0	
C.	TOTAL NONENERGY	DISCOUNTED SAVING	GS or COST		(3.4	\2 + 3Bd4) =		\$0
4 SI	MPLE PAYBACK (SF	PB) - (YRS)		1G/(2G3 + 3A + ((3Bd1/15)) =		0.7
	TAL NET DISCOUN					2G5 + 3C) =		\$7,884
6 SA	VINGS-TO-INVESTI	MENT RATIO (SIR)			`	(5/1G) =		21.12
		. RATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power -	•		27.45
				•	•			

								!
	LOCATION: FOR	T CARSON, COLO	RADO	REGION:	4		PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE				FISCAL YEAR:	1992
	DISCRETE PORTIO	N NAME: E	CO #14 - NIGHT	T SETBACK THER	MOSTAT		BUILDING NO.:	P-2700
	ANALYSIS DATE:	04/14/93		ECONOMIC LIFE	:15		PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS							
	CONSTRUCTION COS	т	=				\$2,344	
	SIOH COST	•	(5.5% of 1A) =				\$129	
C.	DESIGN COST		(6.0% of 1A) =				\$141	
D.	TOTAL COST		(1A + 1B + 1C) =				\$2,614	
E.	SALVAGE VALUE		=				\$0	
F.	SALVAGE VALUE OF E	EXISTING EQUIP.	=				\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =				>	\$2,614
2 EN	IERGY SAVINGS (+)	or COST (-)						
	TE OF NISTIR 85-3273-X		NT FACTORS: C	CTOBER 1992				
	ENERGY	COST	SAVINGS	ANNUAL \$		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)		FACTOR (4)	SAVINGS (5)	
A.	ELEC & DEMAND	\$17.14		\$0		11.70	\$0	
В.	DIST			\$0		13.78	\$0	
	NAT GAS	\$3.48	1,435	\$4,988		14.16	\$70,631	
	COAL			\$0		11.57	\$0	
	SOLAR			\$0			\$0	
	DEMAND SAVINGS	\$69.68 / year	4 405	\$0		11.12	\$0	
G.	TOTAL		1,435	\$4,988			>	\$70,631
	NENERGY SAVINGS	(+) or COST (-)						
A.	ANNUAL RECURRING						\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =		11.12		
	2 DISCOUNTED SAVIN	NGS or COST		$(3A \times 3A1) =$			\$0	
В.	NONRECURRING							
	ITEM		SAVINGS or	YEAR OF		DISCOUNT	DISCOUNTED	,
			COST (1)	OCCURRENCE (2)	i	FACTOR (3)	SVGS or COST (4)	
	a.		\$0	0		0.00	\$0	
	b.		\$0	0		0.00	\$0	
	C.		\$0	0		0.00	\$0	
	d TOTAL		\$0				\$0	
C.	TOTAL NONENERGY	SECOUNTED SAVING	S or COST		(3A	2 + 3Bd4) =		\$0
4 611	ADI E DAVDAOK (CCC)						_
	MPLE PAYBACK (SPB			1G/(2	2G3 + 3A + (3Bd1/15)) =		0.5
5 TO	TAL NET DISCOUNTI	ED SAVINGS			(2	2G5 + 3C) =		\$70,631
6 SA	VINGS-TO-INVESTME	ENT RATIO (SIR)				(5/1 G) =		27.02
7 AD	JUSTED INTERNAL F	RATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power -	1] x 100 =		29.56

						•	
	LOCATION: FOR	T CARSON, COLO	DRADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTIO	N NAME:	CO #14 - NIGHT	SETBACK THEF	MOSTAT		ALL BUILDINGS
	ANALYSIS DATE:	04/14/93	.00 #14 - Mai1				
	ANALISIS DATE:	04/14/93		ECONOMIC LIFE	:: 15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COS	Т	=			\$5,358	
8.	SIOH COST		(5.5% of 1A) =			\$295	
C.	DESIGN COST		(6.0% of 1A) =			\$321	
D.	TOTAL COST		(1A + 1B + 1C) =			\$5,974	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF E	EXISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$5,974
2 EN	IERGY SAVINGS (+)	or COST (-)					
	TE OF NISTIR 85-3273-X	* *	INT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)			
A.	ELEC & DEMAND	\$17.14	22		• •	` `	
В.	DIST			\$0			
C.	NAT GAS	\$3.48	2,631	\$9,145		•	
D.	COAL			\$0	11.57	•	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	·	
G.	TOTAL.		2,653	\$9,522		>	\$133,910
							,
3 NC	NENERGY SAVINGS	(+) or COST (-)					
	ANNUAL RECURRING	(,, ., , ,				\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	11,12	*-	
	2 DISCOUNTED SAVIN			$(3A \times 3A1) =$	11.12	\$0	
				(41741) -		•	
В.	NONRECURRING						
	ITEM	·	SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	• •	SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	C.		\$0	. 0	0.00	\$0	
_	d TOTAL		\$0			\$0	
C.	TOTAL NONENERGY D	ISCOUNTED SAVING	GS or COST		(3A2 + 3Bd4) =		\$0
4 SIN	MPLE PAYBACK (SPB) - (YRS)		1G/(2G3 + 3A + (3Bd1/15)) =		0.6
5 TO	TAL NET DISCOUNTI	ED SAVINGS			(2G5 + 3C) =		
							\$133,910
	VINGS-TO-INVESTME	` ,			(5/1G) ≖		22.42
7 AD	JUSTED INTERNAL F	RATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		27.96

Project UPDATE EXISTING EEAP Location FORT CARSON, COLORADO Architect-Engineer E M C ENGINEERS, INC., 2750 S. WADSWORTH BLVD., DENVER, CO 80227 SHEET 1 OF 1 BASIS FOR ESTIMATE X Code A (No design complete Code B (Preliminary design) Code C (Final design) Other (Specify)	
UPDATE EXISTING EEAP Location	
FORT CARSON, COLORADO Architect-Engineer E M C ENGINEERS, INC., 2750 S. WADSWORTH BLVD., DENVER, CO 80227 Code B (Preliminary design) Code C (Final design) Other (Specify)	
Architect-Engineer Code C (Final design) E M C ENGINEERS, INC., 2750 S. WADSWORTH BLVD., DENVER, CO 80227 Other (Specify)	
Drawing No. Estimator Checked by	
A. NIEMEYER T. FORSTER ECO #14 Quantity Labor Material	
ECO #14 Quantity Labor Material Night Setback Thermostats No. Unit Per Per Total	
Units Meas. Unit Total Unit Total Cost	
	32.80
	01.56
	34.36
	39.37
	\$3.02
	27.68
	30.44
TOTAL PER UNIT \$33	34.87
No. Unit Labor and Material with Overhead, Profit, and Cont. Total Cont	ract
BUILDING NO. Units Meas. Total Cost	
P-1007 3 EA \$334.87 \$1,00	
P-1955 1 EA \$334.87 \$33	34.87
P-1956 1 EA \$334.87 \$33	34.87
P-2055 1 EA \$334.87 \$33	34.87
P-2056 1 EA \$334.87 \$33	34
P-2155 1 EA \$334.87 \$33	34.87
P-2156 1 EA \$334.87 \$33	34.87
P-2700 7 EA \$334.87 \$2,34	14.09
TOTAL ECO #14 \$5,38	57.92
ENG FORM 150 *U.S. GOVERNMENT PRINTING OFFICE 1959 0.5 16148 1 AUG 59 PREVIOUS EDITION MAY BE USED	

		Management of the Association of	BC	EP I	VPUT	FORI	M		Annual to the second second second second second second second second second second second second second second
EMC ENGINEE				2					COLORADO
NEW (1) [UT FILE ()	XXXXXX.IN				BIN CHART FO FCB1		(XBINXX.XX)
EXISTING (2) PROJECT DESCRIPT			CAS	E DESCRIP	TION (20 CH	AR)		or ECM#	DATE (mm/dd/yy)
FTCARSON UP	DATE I	ZEAP	B	ABELI	NE		·	Ø .	11/4/92
PREPARED BY:	(6C) BUILD	NG NAME:				R) # 0F	ZONES	ZONE NUMBE	SYSTEM
AZN		-1955 -12) MONTH		2060		FUEL TYPE	(I)	T. CAPACITY	(0)
HEATING "	9	(1)		1 1		3		0, 3 30 (r	2 MIN
PART LOAD 2 POINTS (R) 0.1 /10	1 1 1	5 6 7	8 9	10 11	EFFICIENC POINTS	Y 1 2 (R) 263 .		5 6 7	8 9 10 11
COOLING	NTH ON GO)-12) MONTH	a	9		FUEL TYPE 3		T. CAPACITY	1 0 11111
PART LOAD 2 POINTS O-1 /.0	1 1 1	5 6 7	8 9	10 11	EFFICIENC POINTS	7 1 2 52 2	1 1	5 6 7	8 9 10 11
BIN Nº HEATING BEGIN	VS (1)	BIN Nº COC ZC		NS (1	· /	N-WORK H	OURS ?	COOL NON-	-WORK HOURS?
CONDUCTION		HIS ZONE ?					SOLAR SOLAR	RAD DISK F	E.
	NORT	ГН	. E/	V AST	ALLS SOU	гн	we	ST	ROOF
AREA (R)	483	3,0	65	7.3	48	33.0	5	89,3	1995.0
U-VALUE (R)	0+1		0.	1	. 0	-1	0	./	0.044
COLOR ADJUSTMENT FACTOR (R)	0.6	5	0.0	65	0.	65	0.	.65	0.8
CLTD (I)	42	23	5	o 7	5	11	4	22	698
EXTERNAL SHADE FACTOR (R)	0.8	8	1.		0.			.0	1.0
ATTIC VENT	LATION 7		PERCENT		SUMMER SUN 7.0	ISHINE (R			NTER SUNSHINE
				SS (VERTI	CAL)	6111			SKYLIGHT OF ROOF GLASS
AREA (R)	N .	73.0	E	SE SE	<u>s</u>	73.0	w	67.5	GLASS
U-FACTOR (R)		1.18				1.18		1.18	
SHADING (R)		1.0				1.0		1.0	
COOLING LOAD (R)	·	5,17				6,23	·	5.16	
MAX SHGF, (I) SUMMER		163				170		163	·
MAX SHGF, (1)		20	! !			241		20	
FACTOR CHONE (2)	FLOOR ARE	0.4 A (2)FI	OR ILVAIT	E COAWI	SPACE TEM	O.4	FYS	OSED PERIM	IETER LENGTH
TYPE & CRAWL	- LUON ARE	(R) 0.3	5 (R) S		w —	(R) 2	211.0	(R)
TEMP RANGE		DESIGN D		RATURE -3.0	R) SPACE HE D フス,		MPERATURE! フスル	D 72.0	LING TEMPERATURE (R) う in 72.0
CONVECTION &	ELEVATION 5840	AIR	FLOW RAT	ES-OCCUP	/ UNOCUP	HEATI	NG AIR TEMP		DUNG AIR TEMP (R) 72.0 IN 0.0
1		NE ? Nº of		DHW	INT	RNAL GAI	NS TYPES PPLIANCES ((4) PEOPLE (5)
FUEL			(1)		/				
DAY: BTUH	/ UNIT		(R)		10,.1	06.0		17.57	20 255.0
	R OF UNITS		(1)		1				2
l 	LOAD FACT		(R)		0.			1,0	
il 		CTION FACT	OR (R)		0.			1.0	70 00
NIGHT: BTUH	R OF UNIT	s	(1)		10,1	06.0	· 	175	(1.0) 0.0 Ø
	LOAD FAC		(R)		0.0	7		1.0	1.0
ii		ECTION FAC	TOR (R)		0.			0-05	
EFFIC	CIENCY		(R)			0,0		100.	
INPUT FILE (XXXX	XX.IN) /	1955,I	N		dut	PUT FILE	(XXXXXX.F	PT) 195	5.RPT

VBCEP INPUT FORM								
EMC ENGINEERS	EMC ENGINEERS, INC. DENVER, COLORADO							
BUILDING NUMBER P=1955								
SUPPLY AIR	OCCUPIED HOURS:		UNOCCUPIED HOURS:					
(ACFM)	3225,0	(R)		(R)				
	OCCUPIED HOURS:	•	UNOCCUPIED HOURS:	·				
MAX OA/SA RATIO	0.20	(R)	0,20	(R)				
	OCCUPIED HOURS:	. *:	UNOCCUPIED HOURS:					
MIN OA/SA RATIO	0.20	(R)	0.20	(R)				
	HEATING OCCUPIED HOURS		HEATING UNOCCUPIED HOURS					
APPROXIMATE	72,0	(R)	72.0	(R)				
RETURN AIR	COOLING OCCUPIED HOURS		COOLING UNOCCUPIED HOURS					
TEMP, *F	72.0	(R)	(R) 72.0					
	DESIRED MIXED AIR TEMPERATURE, *	F						
	0.0 IF FIXED DA OR ZONE CONTROLLED DE O	(R)						
	ECONOMIZER	TYPES						
HTG CLG TYPE 1- "DUMB" TYPE 2-"SMART"								

DEBUG 1 = MONTHLY MIXED AIR REPORT BY BIN INCREMENT
REPORT 2 = ANNUAL REPORT BY MONTH C2-12

BUILDING--P-1955 CASE--BASELINE DATE--11/10/92 PREPARED BY--AJN ZONE # 1 CASE #0

BIN HEATING AND COOLING
LOADS REPORT
BUILDING BOUNDARY

1	BIN			URS	MECH HEAT	MECH HEATING LOADS		ING LOADS
	F		7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
					MBTU	MBTU	MBTU	MBTU
		· · ·				······································		
		-20	0	0	.0000	.0000	.0000	.0000
-20			0	0	.0000	.0000	.0000	.0000
-15	to	-10	0	0	.0000	.0000	.0000	.0000
-10	to	- 5	0	2	.0000	.1007	.0000	.0000
-5	to	0	0	8	.0000	.3757	.0000	.0000
0	to	5	15	94	.4875	4.0913	.0000	.0000
5	to	10	17	121	.4909	4.8744	.0000	.0000
10	to	15	37	168	.9362	6.2243	.0000	.0000
15	to	20	55	303	1.1932	10.2100	.0000	.0000
20	to	25	97	376	1.7577	11.4060	.0000	.0000
25	to	30	112	486	1.6054	13.0760	.0000	.0000
30	to	35	94	353	1.0085	8.3060	.0000	.0000
35	to	40	144	407	1.0187	8.1440	.0000	.0000
40	to	45	135	493	.4385	7.7602	.0000	.0000
45	to	50	181	594	.0069	7.0183	.0000	.0000
50	to	55	175	556	0000ء	4.3211	.0000	.0000
55	to	_. 60	178	563	.0000	2.1864	.0000	.0000
60	to	65	192	621	.0000	.0000	.0000	.0000
65	to	70	210	521	.0000	.0000	.0000	.0000
70	to	75	193	327	.0000	.0000	3.0122	1.4548
75	to	80	192	220	.0000	.0000	3.9081	1.7473
80	to	85	163	114	.0000	.0000	4.4666	1.3088
85	to	90	135	74	.0000	.0000	4.2606	1.1270
90	to	95	15	19	.0000	.0000	.5280	.3527
95	to	100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
Ī	ANN		2340	6420	8.9435	88.0941	16.1755	5.9906

BUILDING--P-1955 CASE--BASELINE DATE--11/10/92 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY HEATING AND COOLING	************
******	LOADS REPORT	************
******	BUILDING BOUNDARY	*******

MONTH	MECH HEATI	NG LOADS	MECH COOL	MECH COOLING LOADS		
	7 - 16	17 - 6	7 - 16	17 - 6		
	MBTU	MBTU	MBTU	MBTU		
01 JAN	2.2403	15.9270	.0000	.0000		
02 FEB	2.0337	14.2660	.0000	.0000		
03 MAR	1.1618	12.2380	.0000	.0000		
04 APR	.3621	7.0492	.0000	.0000		
05 MAY	.0214	4.2106	1.0158	.3521		
06 JUN	.0000	.0000	2.5950	.6062		
07 JUL	.0000	.0000	4.8587	2.7834		
08 AUG	.0000	.0000	4.6110	1.3376		
09 SEP	.0089	2.8582	3.0950	.9112		
10 OCT	. 0586	6.5823	.0000	.0000		
11 NOV	1.7168	12.1200	.0000	.0000		
12 DEC	1.3401	12.8430	.0000	.0000		
ANN	8.9435	88.0941	16.1755	5.9906		

Building Boundary Energy per Square Foot of Total Building area = 57865.8 BTU

BUILDING--P-1955 CASE--BASELINE DATE--11/10/92 PREPARED BY--AJN ZONE # 1 CASE #0

******	BIN SOLAR ENERGY REPORT	*******
******	DIRECT GAIN THROUGH	*******
******	WINDOWS AND SKYLIGHTS	******

BIN F	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16 MBTU
-25 to -20 -20 to -15 -15 to -10 -10 to -5 -5 to 0 0 to 5 5 to 10 10 to 15 15 to 20 20 to 25 25 to 30 30 to 35	0 0 0 0 0 15 17 37 55 97 112	.0000 .0000 .0000 .0000 .0000 .0444 .0556 .1326 .2142 .4078 .5056
35 to 40 40 to 45 45 to 50 50 to 55 55 to 60 60 to 65 65 to 70 70 to 75 75 to 80 80 to 85 85 to 90 90 to 95 95 to 100 100 to 105	144 135 181 175 178 192 210 193 192 163 135 15 0	.4535 .7395 .7351 1.0418 1.0616 1.1350 1.2838 1.4694 1.4103 1.4626 1.2922 1.1122 .1282 .0000 .0000
ANN	2340	14.6855

BUILDING--P-1955 CASE--BASELINE DATE--11/10/92 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY	INTERNAL GAINS	REPORT:	******
******	LOADS	AND RAW SOURCE	ENERGY	******
******		CONSUMPTION	******	

MONTH	LIGHTS	MISC	PEOPLE	APPLIANC
	ELEC	ELEC		ELEC
	MBTU	MBTU	MBTU	MBTU
01 J	1.9934	.3808	.0964	3.2684
02 F	1.8615	.3595	.0918	2.9521
03 M	2.1116	.4109	.1056	3.2684
04 A	1.9692	.3787	.0964	3.1630
05 M	2.0525	.3959	.1010	3.2684
06 J	2.0283	.3937	.1010	3.1630
07 J	1.9934	.3808	.0964	3.2684
08 A	2.1116	.4109	.1056	3.2684
09 S	2.0283	.3937	.1010	3.1630
10 0	1.9934	.3808	.0964	3.2684
11 N	2.0283	.3937	.1010	3.1630
12 D	2.0525	.3959	.1010	3.2684
TOT	24.2241	4.6754	1.1934	38.4827
RAW SOURCE	82.3321	15.8905	1.1934	130.7937

BUILDING--P-1955 CASE--BASELINE DATE--11/10/92 PREPARED BY--AJN ALL ZONES CASE #0

******	MONTHLY HEATING AND COOLING	******
******	OUTSIDE AIR LOADS	******
******	BUILDING BOUNDARY	******

MONTH	HEATING MBTU	COOLING MBTU
01 JAN	18.96422	.00000
02 FEB	17.23809	.00000
03 MAR	14.94177	.00000
04 APR	9.12972	.00000
05 MAY	5.61314	.16279
06 JUN	.00000	.58685
07 JUL	.00000	2.19137
08 AUG	.00000	1.26906
09 SEP	3.48385	.90961
10 OCT	7.33532	•00000
11 NOV	14.99481	.00000
12 DEC	15.18469	.00000
ANN	106.88560	5.11968

BUILDING--P-1955 CASE--BASELINE DATE--11/10/92 PREPARED BY--AJN ALL ZONES CASE #0

******	MONTHLY HEATING	AND COOLING	******
******	RAW SOURCE	ENERGY	******
******	CONSUMPTION	REPORT	******

MONTH		AL HEATING NAT GAS MBTU	TC	OTAL COOLING NAT GAS MBTU
01 J		58.8461	and the same of th	.0000
02 F		53.1498		.0000
03 M		44.9152		.0000
04 A		26.2139		.0000
05 M		15.6024		2.9380
06 J		.0000		7.2706
07 J		.0000		18.8742
08 A		.0000		13.8534
09 S		10.0648		9.4355
10 0		22.1492		.0000
11 N		45.6918		.0000
12 D		46.5416		.0000
ANN		323.1747	-	52.3718
226121		323.1747		32.3710
BTU/SF/YR	HEATING:	156880.9	COOLING:	25423.2

Raw Source Energy per Square Foot of Total Building Area = 182304.1 BTU

EMC ENGI	NEE	RS.	ΙN	С.			В	CE	:Р . Э	- II		UT			٠		٠.,	DEN	IVER	., (COLO	ORAI	00	
CASE TYPE	E	XISTI	NG INF	UT F				(NI			To	nly	Cher	nge:	1	IN CHA	ARTF	OR T	HIS R	N	XBIN	XX.XX	,	
NEW (L)			95	55	<u>, I</u>	<i>[</i> 4					A	re S	no:	ún.										
PROJECT DES	CRIPT	ION (20 CH	IAR)						-		(20 C)		. (CASE	or E	CM #			E (mr	•	
PREPARED BY:		ECI I	BUILD	NG A	IAME							BACK REA		1 #	0F 7	ONES	-/-	ZONI	E NUA	ARFR		//0	· · · · · · · · · · · · · · · · · · ·	
PREPARED BI			•														(1)			(,) S1	STE	4 1	Y N
HEATING	MO	NTH C	ON (OC		MON	тн о	FF (O		DD	CORR.	. FAC		FUE	EL TY	PE		EQP	т. С.	APACI		# 1%	ART LO	2 1	MIN
PART LOAD I	2	3	4	(i) 5	6	7	8	(1)	10	111	EF	(R) FICIEN	CY	li .	2	(<u>()</u> 3	4	5	6	(R)	8	9	_	MAX II
POINTS (R)									<u> </u>	\perp	PO	HNTS	(R)				500		D4C'	Ļ	<u> </u>	L ABT I	200 (TE
COOLING	MOI	NTH C	ON (OC)-12) (1)	MON	пно	FF (O	(1)				:	FU	EL TY	PE.	(1)	EUP	1. 6	APACI	(R)	# "	ART L	2 N	
PART LOAD POINTS	2	3	4	5	6	7	8	9	Ю	11		FICIE	VCY	1	2	3	4	5	6	7	8	9	10	"
BIN Nº HEATING	BEGIN	is	(1)	BIN	N ₈ C	00LI	NG B	EGINS	3	(1)	1	EAT N	ON-1		HOI	URS ?	•	co	OL N		VORK	HOUR	s?	
CONDUCTION	V	1	RUN T	HIS Z	ONE '	?				- (**	ـــــــــــــــــــــــــــــــــــ					S	OLAR	RA	D DISI	(FIL	E:			
· · · · · · · · · · · · · · · · · · ·										W	NI.S									T				
AREA	(R)		NOR'	TH		Т		EAS	T		Т	SO	UTH				WE	ST		+		ROOF	-	
U-VALUE	(R)					+					+									+				•
COLOR ADJUSTN FACTOR	ENT (R)		-			\dagger					${\mathsf T}$						· · · · · ·	-		\dagger				
CLTD	(1)					\dagger					十									\dagger				
EXTERNAL SHA	DE (R)					T					T	•						-		T				
ATTIC Y		LATIC	ON 7			P	ERCE	NT P	ossi	BLE S	UMN	AER SL	JNSH	INE	(R)	PERC	ENT	POSS	SIBLE	WINT	ER S	UNSH	INE	(R)
•		N	 I	-	NE		G	LASS		ERTIC	AL)	s		sw		w	,		NW	s	KYLI	GHT o		OF
AREA	(R)																							
U-FACTOR	(R)										ŀ													
SHADING COEFFICIENT	(R)																			$oxed{oxed}$				
COOLING LOAD FACTOR	(R)										L									\perp				
MAX SHGF, SUMMER	(1)										L									┵				
MAX SHGF, WINTER	(ı)																			\perp				
EXTERNAL SHAP FACTOR	E (R)					\prod																		
FLOOR C: NONE TYPE 2: CRAWL	(2)	FLOO	R ARE	A (R)		100	R U-V	ALUE (R)	1 -	AWL	SPAC	CE TE	MPE W	RATU	RE	(R)		OSE	D PE	RIME	TER	LENG	TH	(R)
TEMP RANGE	<u>'</u>	-		DE:	SIGN	DAY	TEM	PER/		E (F		ACE H				ERAT		d SA	ACE C			MPEF		
CONVECTION	Y	ELE	VATION	i	A	IR FL		ACF		CCUP/		CUP		HE/	TIN	S AIR O I	TEMP				NG A 3 / O	IR TEI	100.	(S)
INTERNAL GAINS	R	UN TI	HIS ZO		J N ₅	of T		}	DI	1W (.i) T		TERN HTS		_	TYP PLIANC		3)	MIS	С.	(4)	PEO	PLE	(5)
l	JEL 1	TYPE					(1				I											\leq	\leq	\leq
DAY: B	TUH	/ UNI	T				G	0			\Box													
. N	JMBE	R OF	UNIT	s			(I	工			$oldsymbol{oldsymbol{oldsymbol{oldsymbol{\Box}}}$													
<u> </u>	PACE	LOAD	FAC1	FOR			(F				$oldsymbol{ol}}}}}}}}}}}}}}}}}}$							_			_			
S	CHED	ULE (CORRE	CTIC	N FA	CTOR		-			\bot				<u> </u>			\bot			\dashv			
NIGHT: B	TUH	/ UNIT					(R	-			4				_			4						
H			UNIT				(1	-		-	\dashv							_						
_			D FAC				(R	-			4				 			+						_
-			CORR	ECTI	ON F	сто		—			\dashv				-			+			_	=		
INDUT FILE /Y		HENC		10			(F	U				٠٠.٠	rour	r eu		XXXX	/VV 5	PT	10			<u></u>	$\stackrel{\sim}{=}$	

VBCEP INPUT FORM								
EMC ENGINEER	S. INC.		DENVER,	COLORADO				
BUILDING NUMBER P-1955								
SUPPLY AIR	OCCUPIED HOURS:		UNOCCUPIED HOURS:					
(ACFM)		(R)		(R)				
MAX OA/SA RATIO	OCCUPIED HOURS:	(R)	UNOCCUPIED HOURS:	(R)				
MIN OA/SA RATIO	OCCUPIED HOURS:	(R)	UNOCCUPIED HOURS:	(R)				
	HEATING OCCUPIED HOURS		HEATING UNOCCUPIED HOURS					
APPROXIMATE	68.0	(R)_	55.0	(R)				
RETURN AIR TEMP, *F	COOLING OCCUPIED HOURS		COOLING UNOCCUPIED HOURS					
I CWL	78.0	(R)	120.0	(R)				
	DESIRED MIXED AIR TEMPERATURE, "F							
	G.G IF FIXED GA OR ZONE CONTROLLED	(R)						
	ECONOMIZER T	YPES						
	HTG CLG		HTG CLG TYPE 2-"SMART"					
		·		•				

ELEVATION IN FEET (R)

DEBUG 1 = MONTHLY

REPORT

1 = MONTHLY MIXED AIR REPORT BY BIN INCREMENT

2 - ANNUAL REPORT BY MONTH

C2-2

BUILDING--P-1955
CASE--ECO #14 - NIGHT SETBACK
DATE--11/10/92
PREPARED BY--AJN

ZONE # 1 CASE #1

BIN HEATING AND COOLING LOADS REPORT BUILDING BOUNDARY

]	BIN		HO	URS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
	F		7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
					MBTU	MBTU	MBTU	MBTU
				·				
-25	to	-20	0	0	.0000	.0000	.0000	.0000
-20	to	-15	0	0	.0000	.0000	.0000	.0000
		-10	0	0	.0000	.0000	.0000	.0000
-10		-5	0	2	.0000	.0780	.0000	.0000
- 5	to	0	0	8	.0000	.2851	.0000	.0000
0	to	5	15	94	.4475	3.0262	.0000	.0000
5	to	10	17	121	.4456	3.5034	.0000	.0000
10	to	15	37	168	.8375	4.3208	.0000	.0000
15	to	20	55	303	1.0466	6.7769	.0000	.0000
20	to	25	97	376	1.4991	7.1463	.0000	.0000
25	to	30	112	486	1.3068	7.5692	.0000	.0000
30	to	35	94	353	.7579	4.3065	.0000	.0000
35	to	40	144	407	.6348	3.5667	.0000	.0000
40	to	45	135	493	.0821	2.4691	.0000	.0000
45	to	50	181	594		1.0133	.0000	.0000
	to	55	175	556	.0000	.0000	.0000	.0000
55	to	60	178	563	.0000	.0000	.0000	.0000
60	to	65	192	621	.0000	.0000	.0000	.0000
65	to	70	210	521	.0000	.0000	.0000	.0000
70	to	75	193	327	.0000	.0000	2.4453	.0000
75	to	80	192	220	.0000	.0000	3.2830	.0000
80	to	85	163	114	.0000	.0000	3.8454	.0166
85	to	90	135	74	.0000	.0000	3.7363	.2578
90	to	95	15	19	.0000	.0000	.4698	.1295
95	to	100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
7	ANN		2340	6420	7.0580	44.0616	13.7798	.4039

BUILDING--P-1955 CASE--ECO #14 - NIGHT SETBACK DATE--11/10/92 PREPARED BY--AJN ZONE # 1 CASE #1

******	MONTHLY HEATING AND COOLING	******
*****	LOADS REPORT	*****
*****	BUILDING BOUNDARY	***********

MONTH	MECH HEATI	NG LOADS	MECH COOL	ING LOADS
	7 - 16	17 - 6	7 - 16	17 - 6
	MBTU	MBTU	MBTU	MBTU
01 JAN	1.8054	9.6462	.0000	.0000
02 FEB	1.6791	8.7179	.0000	.0000
03 MAR	.9112	6.4869	。0000	.0000
04 APR	.2123	2.5727	.0000	.0000
05 MAY	.0067	.6087	.8411	.0002
06 JUN	.0000	.0000	2.1950	.0260
07 JUL	.0000	.0000	4.1753	.3014
08 AUG	.0000	.0000	3.9276	.0529
09 SEP	0009ء	.3440	2.6407	.0235
10 OCT	。0319	2.0616	.0000	.0000
11 NOV	1.3695	6.5307	.0000	.0000
12 DEC	1.0411	7.0929	.0000	.0000
ANN	7.0580	44.0616	13.7798	.4039

Building Boundary Energy per Square Foot of Total Building area = 31700.6 BTU

BUILDING--P-1955
CASE--ECO #14 - NIGHT SETBACK
DATE--11/10/92
PREPARED BY--AJN

ZONE # 1 CASE #1

******	BIN SOLAR ENERGY REPORT	******
*****	DIRECT GAIN THROUGH	******
******	WINDOWS AND SKYLIGHTS	*******

BIN F	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16 MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	15	.0444
5 to 10	17	.0556
10 to 15	37	.1326
15 to 20	55	.2142
20 to 25	97	.4078
25 to 30	112	.5056
30 to 35	94	.4535
35 to 40	144	.7395
40 to 45	· · · · · · · · · · · · · · 135	.7351
45 to 50	181	1.0418
50 to 55	175	1.0616
55 to 60	178	1.1350
60 to 65	192	1.2838
65 to 70	210	1.4694
70 to 75	193	1.4103
75 to 80	192	1.4626
80 to 85	163	1.2922
85 to 90	135	1.1122
90 to 95	15	.1282
95 to 100	0	.0000
100 to 105	0	.0000
ANN	2340	14.6855

BUILDING--P-1955 CASE--ECO #14 - NIGHT SETBACK DATE--11/10/92 PREPARED BY--AJN ZONE # 1 CASE #1

*****	MONTHLY	INTERNA	L GAINS	REPORT:	******
*****	LOADS	AND RAW	SOURCE	ENERGY	******
*******	CONSUMPTION				*****

MONTH	LIGHTS	MISC	PEOPLE	APPLIANC
	ELEC	ELEC		ELEC
	MBTU	MBTU	MBTU	MBTU
01 J	1.9934	.3808	.0964	3.2684
02 F	1.8615	.3595	.0918	2.9521
03 M	2.1116	.4109	.1056	3.2684
04 A	1.9692	.3787	.0964	3.1630
05 M	2.0525	.3959	.1010	3.2684
06 J	2.0283	.3937	.1010	3.1630
07 J	1.9934	.3808	.0964	3.2684
08 A	2.1116	.4109	.1056	3.2684
09 S	2.0283	.3937	.1010	3.1630
10 O	1.9934	.3808	.0964	3.2684
11 N	2.0283	.3937	.1010	3.1630
12 D	2.0525	.3959	.1010	3.2684
TOT	24.2241	4.6754	1.1934	38.4827
RAW SOURCE	82.3321	15.8905	1.1934	130.7937

BUILDING--P-1955 CASE--ECO #14 - NIGHT SETBACK DATE--11/10/92 PREPARED BY--AJN ALL ZONES CASE #1

******	MONTHLY HEATING AND COOLING	******
******	OUTSIDE AIR LOADS	******
******	BUILDING BOUNDARY	******

MONTH	HEATING MBTU	COOLING MBTU	
		11.510	
01 JAN	13.21367	.00000	
02 FEB	12.11502	.00000	
03 MAR	9.56449	.00000	
04 APR	4.74331	.00000	
05 MAY	2.01729	.09367	
06 JUN	.00000	.29060	
07 JUL	.00000	.57218	
08 AUG	.00000	.45283	
09 SEP	.95335	.38850	
10 OCT	3.15459	.00000	
11 NOV	9.78682	.00000	
12 DEC	9.87343	.00000	
ANN	65.42197	1.79779	

BUILDING--P-1955
CASE--ECO #14 - NIGHT SETBACK
DATE--11/10/92
PREPARED BY--AJN

ALL ZONES CASE #1

******	MONTHLY HEATIN	G AND COOLING	******
******	RAW SOUR	E ENERGY	*******
******	CONSUMPTIO	N REPORT	******

MONTH	TOTAL HEATING NAT GAS MBTU		TO	TAL COOLING NAT GAS MBTU
One Foreign Street, and Street			<u></u>	
01 J		39.0891		.0000
02 F		35.6767		.0000
03 M		26.8821		.0000
04 A		11.9307		.0000
05 M		4.1722		1.7945
06 J		.0000		4.8209
07 J		.0000		9.6908
08 A		.0000		8.5092
09 S		2.0575		5.8593
10 0		8.3170		.0000
11 N		28.0301		.0000
12 D		28.5379		.0000
ANN		184.6933		30.6747
BTU/SF/YR	HEATING:	89657.0	COOLING:	14890.6

Raw Source Energy per Square Foot of Total Building Area = 104547.6 BTU

				BC	EP IN	PUT	FOR			
EMC ENG	INEE									COLORADO
CASE TYPE NEW	<u> </u>	XISTING INP		XXXXXX.IN			1			(XBINXX.XX)
PROJECT DE	SCRIPT	2055 10N (20 CH	(IN	CAS	E DESCRIPTI	ON (20 CH4	AR)	FC BI	or ECM#	DATE (mm/sid/yy)
FTCARSON					BASELL	,			Ø	11/20/92
PREPARED BY:	<u> </u>	(6C) BUILD	NG NAME:	(6C)	TOTAL FLOO		R) # 0F	ZONES	ZONE NUMBE	R FAN
AJW			-2055		2060			(1)		(I) SYSTEM N
HEATING	MO	NTH ON (OC			DD CORR.		UEL TYPE	1 .	T. CAPACITY	0.444
PART LOAD I	2	1- 1	(i) - 5 6 7	ر) <u>خ</u> اه اه	10 11	T CECICIENO	7 17 16	12 4	15 6 7	XAM II — (S
POINTS (R)	1/1.0		֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓			POINTS (R) . 63 .	63		
		NTH ON COC)-12) MONT		<u>u</u>		UEL TYPE	EQ!	T. CAPACITY	2 44184
COOLING		5	(1)		0	<u> </u>	3		4,853	D Z II MAX
PART LOAD POINTS	1 1.0	1 1 1	5 6 7	8 9	10 11	EFFICIENC POINTS	در 22م	SZ	5 6 7	8 9 10 11
BIN Nº HEATING	BEGU	NS (I)	BIN Nº CO	OLING BEGI	NS (i)	HEAT NON		ours ?	COOL NON	-WORK HOURS?
CONDUCTI	ON	RUN T	HIS ZONE ?			<u> </u>			RAD DISK F	ILE
			Y N		WA	LLS	•		OLAR.	V2
		NOR'	ГН	T	ST	SOUT	H	T	EST	ROOF
AREA	(R)	48	3.0	65	7.33	48	3.0	5	39.3	1995.0
U-VALUE	(R)	0.1	10	0	. 10	0.	<u> </u>	0	. 1	0.044
COLOR ADJUS FACTOR	(R)	0.0	65	0	.65	0.0	65		.65	0.8
CLTD	(1)	42	23	50	7	-5	7/	4	22	698
EXTERNAL SH FACTOR	(R)	0.	8	100			8 '		,0	1.0
ATTIC Y		LATION ?		PERCENT	POSSIBLE SI		SHINE (R			NTER SUNSHINE
		N	NE	GLA E	SS (VERTICA SE	AL) S	sw	w	NW	SKYLIGHT or ROOF GLASS
AREA	(R)		73.0				73.0		67,5	
U-FACTOR	(R)		1.18				1.18		1.18	
SHADING COEFFICIENT	(R)		1.0				1,0		1.0	
COOLING LOAD FACTOR) (R)		5.17				6.23	•	5.16	
MAX SHGF, SUMMER	(1)		/63				170		163	
MAX SHGF, WINTER	(1)		20				241		20	
EXTERNAL SH FACTOR	(R)		0.4				0.4		1.0	
FLOOR O-MONE TYPE 2 CRAW	(2)	FLOOR ARE	(R) 0	5 (I	E CRAWL S	v		(R) 2	211.0	METER LENGTH (R)
TEMP RANGE	,		DESIGN D	AY TEMPE	RATURE (R	SPACE HE		MPERATURE	R SPACE COO	LING TEMPERATURE (R
CONVECTIO		ELEVATION CQ 47		FLOW RAT	ES-OCCUP/ M(R) Or	UNOCUP	HEATI	NG AIR TEM	72.0 D	DLING AIR TEMP (R) 72.0 IN 0.0
INTERNAL		UN THIS ZO	ONE ? Nº of	TYPES?		INTE	RNAL GAI	NS TYPES		
GAINS	FUEL	<u>(Ý)</u> N TYPE	<u> </u>	(1)	DHW (I	, LIGHT	13 (2) A	PPLIANCES	(3) MISC.	(4) PEOPLE (5)
DAY:		/ UNIT		(R)		10.1	06.0		175	7.0 255.0
	NUMBE	R OF UNIT	S	(1)					1	2.
	SPACE	LOAD FACT	FOR	(R)		0.	9		1.0) /.0
	SCHED	ULE CORRE	CTION FACT	TOR (R)		0.	75		1.0	1,0
NIGHT:	втин	/UNIT		(R)		10,1	06.0		175	7.0 0.0
		ER OF UNIT		(1)		1				
		E LOAD FAC		(R)		0.0			1.0	,
		DULE CORR	ECTION FAC			0.			0.0	
		CIENCY		(R) j			0.0	lyyym	1000	
INPUT FILE	XXXX	XX.IN)	2055.	IN		QUTP	UT FILE	(xxxxxx.	KPT/ 205	55.RPT

VBCEP INPUT FORM DENVER, COLORADO EMC ENGINEERS, INC. BUILDING NUMBER P-2055 UNOCCUPIED HOURS: OCCUPIED HOURS: SUPPLY AIR 3225.0 (R) (ACFM) 3225.0 (R) UNOCCUPIED HOURS: OCCUPIED HOURS: MAX OA/SA RATIO 0,95 0.05 (R) (R) UNOCCUPIED HOURS: OCCUPIED HOURS: MIN OA/SA RATIO 0.05 (R) 0.05 (R) HEATING UNOCCUPIED HOURS HEATING OCCUPIED HOURS **APPROXIMATE** 72.0 (R) 72.0 (R) COOLING UNOCCUPIED HOURS RETURN AIR COOLING OCCUPIED HOURS TEMP. "F 72.0 (R) (R) 72.0 DESIRED MIXED AIR TEMPERATURE, "F (R) DO IF FIXED OA OR ZONE CONTROLLED ECONOMIZER TYPES TYPE 2-"SMART" TYPE 1 - "DUMB"

BIN INCREMENT

C2-28

ELEVATION	IN FEET (R) 5870.0
DEBUG	1 = MONTHLY MIXED AIR REPORT BY
REPORT	2: ANNUAL REPORT BY MONTH

BUILDING--P-2055 CASE--BASELINE DATE--11/20/92 PREPARED BY--AJN

******	BIN HEATING AND COOLING	**********
*****	LOADS REPORT	**********
******	BUILDING BOUNDARY	******

\mathtt{BIN}	HOURS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
F	7-16 17- 6	7 - 16	17 - 6	7 - 16	17 - 6
		MBTU	MBTU	MBTU	MBTU
-25 to -20	0 0	.0000	.0000	.0000	.0000
-20 to -15	0 0	.0000	.0000	.0000	.0000
-15 to -10	0 0	.0000	.0000	.0000	.0000
-10 to -5	0 2	.0000	.1007	.0000	.0000
-5 to 0	0 8	.0000	.3757	.0000	.0000
0 to 5	15 94	.4875	4.0913	.0000	.0000
5 to 10	17 121	.4909	4.8744	.0000	.0000
10 to 15	37 168	.9362	6.2243	.0000	.0000
15 to 20	55 303	1.1932	10.2100	.0000	.0000
20 to 25	97 376	1.7577	11.4060	.0000	.0000
25 to 30	112 486	1.6054	13.0760	.0000	.0000
30 to 35	94 353	1.0085	8.3060	.0000	.0000
35 to 40	144 407	1.0187	8.1440	.0000	.0000
40 to 45	135 493	.4385	7.7602	.0000	.0000
45 to 50	181 594	.0069	7.0183	.0000	.0000
50 to 55	175 556	.0000	4.3211	.0000	.0000
55 to 60	178 563	.0000	2.1864	.0000	.0000
60 to 65	192 621	.0000	.0000	.0000	.0000
65 to 70	210 521	.0000	.0000	.0000	.0000
70 to 75	193 327	.0000	.0000	3.0122	1.4548
75 to 80	192 220	.0000	.0000	3.9081	1.7473
80 to 85	163 114	.0000	.0000	4.4666	1.3088
85 to 90	135 74	.0000	.0000	4.2606	1.1270
90 to 95	15 19	.0000	.0000	.5280	.3527
95 to 100	0 0	.0000	.0000	.0000	.0000
100 to 105	0 0	.0000	.0000	.0000	.0000
ANN	2340 6420	8.9435	88.0941	16.1755	5.9906

BUILDING--P-2055 CASE--BASELINE DATE--11/20/92 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY HEATING AND COOLING	******
******	LOADS REPORT	******
******	BUILDING BOUNDARY	******

MONTH	MECH HEATI	MECH HEATING LOADS		MECH COOLING LOADS		
	7 - 16	17 - 6	7 - 16	17 - 6		
	MBTU	MBTU	MBTU	MBTU		
01 JAN	2.2403	15.9270	.0000	.0000		
02 FEB	2.0337	14.2660	.0000	.0000		
03 MAR	1.1618	12.2380	.0000	.0000		
04 APR	.3621	7.0492	.0000	.0000		
05 MAY	.0214	4.2106	1.0158	.3521		
06 JUN	.0000	.0000	2.5950	.6062		
07 JUL	.0000	.0000	4.8587	2.7834		
08 AUG	.0000	.0000	4.6110	1.3376		
09 SEP	.0089	2.8582	3.0950	.9112		
10 OCT	.0586	6.5823	.0000	.0000		
11 NOV	1.7168	12.1200	.0000	.0000		
12 DEC	1.3401	12.8430	.0000	.0000		
ANN	8.9435	88.0941	16.1755	5.9906		

Building Boundary Energy per Square Foot of Total Building area = 57865.8 BTU

BUILDING--P-2055 CASE--BASELINE DATE--11/20/92 PREPARED BY--AJN

*****	BIN SOLAR ENERGY REPORT	******
*****	DIRECT GAIN THROUGH	******
******	WINDOWS AND SKYLIGHTS	******

BIN F	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16 MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	15	.0444
5 to 10	17	.0556
10 to 15	37	.1326
15 to 20	55	.2142
20 to 25	97	.4078
25 to 30	112	.5056
30 to 35	94	.4535
35 to 40	144	.7395
40 to 45	135	.7351
45 to 50	181	1.0418
50 to 55	175	1.0616
55 to 60	178	1.1350
60 to 65	192	1.2838
65 to 70	210	1.4694
70 to 75	193	1.4103
75 to 80	192	1.4626
80 to 85	163	1.2922
85 to 90	135	1.1122
90 to 95	15	.1282
95 to 100	0	.0000
100 to 105	0	.0000
ANN	2340	14.6855

BUILDING--P-2055 CASE--BASELINE DATE--11/20/92 PREPARED BY--AJN

******	MONTHLY	INTERNAL GAINS REPORT:	*****
******	LOADS	AND RAW SOURCE ENERGY	*****
*****		CONSUMPTION	******

MONTH	LIGHTS ELEC	MISC ELEC	PEOPLE	APPLIANC ELEC
	MBTU	MBTU	MBTU	MBTU
01 J	1.9934	.3808	.0964	3.2684
02 F	1.8615	.3595	.0918	2.9521
03 M	2.1116	.4109	.1056	3.2684
04 A	1.9692	.3787	.0964	3.1630
05 M	2.0525	.3959	.1010	3.2684
06 J	2.0283	.3937	.1010	3.1630
07 J	1.9934	.3808	.0964	3.2684
08 A	2.1116	.4109	.1056	3.2684
09 S	2.0283	.3937	.1010	3.1630
10 O	1.9934	.3808	.0964	3.2684
11 N	2.0283	.3937	.1010	3.1630
12 D	2.0525	.3959	.1010	3.2684
TOT	24.2241	4.6754	1.1934	38.4827
RAW SOURCE	82.3321	15.8905	1.1934	130.7937

BUILDING--P-2055 CASE--BASELINE DATE--11/20/92 PREPARED BY--AJN ALL ZONES CASE #0

*****	MONTHLY HEATING AND COOLING	******
******	OUTSIDE AIR LOADS	******
******	BUILDING BOUNDARY	******

MONTH	HEATING	COOLING
	MBTU	MBTU
01 JAN	12.72550	.00000
02 FEB	11.84763	.00000
03 MAR	11.27862	.00000
04 APR	7.49994	.00000
05 MAY	4.71023	.04070
06 JUN	.00000	.14671
07 JUL	.00000	.54784
08 AUG	.00000	.31727
09 SEP	2.24236	.22740
10 OCT	4.40270	.00000
11 NOV	11.25570	.00000
12 DEC	11.22699	.00000
2 2727	77 10067	1 07003
ANN	77.18967	1.27993

BUILDING--P-2055 CASE--BASELINE DATE--11/20/92 PREPARED BY--AJN ALL ZONES CASE #0

*****	MONTHLY HEATING	AND COOLING	******
******	RAW SOURCE	ENERGY	******
******	CONSUMPTION	REPORT	******

MONTH		AL HEATING NAT GAS MBTU		AL COOLING NAT GAS MBTU
		40.0500		0000
01 J		48.9590		.0000
02 F		44.6070		.0000
03 M		39.1099		.0000
04 A		23.6310		.0000
05 M		14.1715		2.7037
06 J		.0000		6.4258
07 J		.0000		15.7197
08 A		.0000		12.0266
09 S		8.0973		8.1261
10 O		17.5016		.0000
11 N		39.7661		.0000
12 D		40.2695		.0000
			-	
ANN		276.1129		45.0019
BTU/SF/YR	HEATING:	134035.4	COOLING:	21845.6

Raw Source Energy per Square Foot of Total Building Area = 155881.0 BTU

				_		E	3CI	EP	~ [[NF	TUS	F	OR	M		_		urr		CO1 -	0 D A I	20	
EMC ENG								2.5												COL			
CASE TYPE NEW EXISTING	(1)		TING IN			(XXXX)	(X.IN)				only C			BIN	I CHA	RTFC	OR TI	HIŞ .H	UN	(XBIN	xx.xx	,	
PROJECT D					<u> </u>					TION	1 (20 C	HAR)			C	ASE	or E	CM #	:	1	E (mn	-	
											BACK		# 0	 -	L_	_/.	ZONE	NUI	ADE S		120		
PREPARED BY:			BUILD								AREA				(w				(1) 51	FAN (STEI	4 1	<u> </u>
HEATING		IONT	H ON (O	0-12) (1)	1	H OFF	(01-12 (1)	. !	COR	R. FA	CTOR (R)	FUE	L TYP	E	(0)	EQP	r. c./	APAC	TY (R)		ART LO	2 1	PTS MIN MAX
PART LOAD I	2	3	4	5	6	7 8	9	10	11		FFICIEN	CY (R)	1 8	2	3	4	5	6	7	8	9	10	111
COOLING	M	ONT	H ON (O	0-12		тногг		וו				FUE	L TYP	ε	()	EQP	T. CA	PACI	TY (R)	# P	ART L	2 N	PTS. MIN MAX
PART LOAD POINTS	2	3	4	5	6	7 8	9	10	11		FFICIEN	ICY	1 2	2		4	5	6	7	8	9	Ю	H
BIN Nº HEATIN	G BE	SINS	(1)	BIN	Nº CC	OOLING	BEGII	NS		1	HEAT NO		WORK N		RS ?		coc	_	ON-	WORK	HOUR	5 ?	
CONDUCT	ION		RUN 1	HIS Z	ONE ?					مطبير					SC	OLAR	RA	DIS	K FI	LE:			
			NOF	тн			EA	ST	W	VALL	s sou	лтн				WE	ST				ROO	F	
AREA	(R)									I													
U-VALUE	(R)									\perp				\perp					_				
COLOR ADJUS FACTOR	TMEN (R	. 1								\bot				\perp					_				
CLTD	(1)	_								\bot									_				
EXTERNAL S FACTOR	(R						-			\perp			,				2006	2015		TEO (NA CO		
ATTIC	YEN		TION ?			PER			4.5		MER SU	NSH		R)	PERC	ENI		SIRCE	WIN	ITER S			(R)
			N	_	NE	·	GLA:		VERTI SE	CAL.	s		sw		w		_	NW	_	SKYL	GHT 6		
AREA	(F	₹)		<u> </u>				_		\bot		4		_			_		_				
U-FACTOR	(F	3)						_		\bot		\bot		_					_				
SHADING COEFFICIENT	1)	υ V		╙				lacksquare		\downarrow		4		_			_		\perp				
FACTOR LOA		₹		╀				igapha		_		4		4		<u>.</u>	_		-				
MAX SHGF, SUMMER	("		$oldsymbol{oldsymbol{\perp}}$				_		4		\bot		_			_		4				
MAX SHGF,		"					<u> </u>	<u> </u>		\bot		\bot		4			<u> </u>		_				
FLOOR O NON	- (1	RJ CI	000.40		Vale		3/01/1		DAWI	لِ	ACE TE	<u></u>	DATHE			EVP	OSE	n es	BIM	ETER	1 FNG	TH	
TYPE 2 CRA	M.	2) FL	OOR AR	(R	<u> </u>		(1	R) S				W			(R)								(R) PE (P
TEMP RANGE	1)			s		DAY TE	ĮW)	IEA!	IN				D			·1	N		
CONVECTI) NC	V	LEVATIO			R FLOW	ACI	ES-C FM(R)		/ UN	ACF		06	<u>8.6</u>	0 IN					UNG 4			(R) 9.0
INTERNAL GAINS				ONE	? Nº (of TYPE	(i)	D	НW	(1)			(2)				3)	MIS	SC.	(4)	PEC	PLE	(5)
		L TY					(1)				<u> </u>						+				=	<u>~</u>	_
DAY:		H/U	OF UNIT	rs			(F)				-						+						
			DAD FAC				(R)										+				-		
			E CORR		ON FAC	CTOR	(F2)																
NIGHT:	вти	H/U	NIT				(R)										I						
	NUN	BER	OF UNI	TS			(1)										\perp						
			.OAD FA				(R)													·			
	SCH	EDUL	E COR	RECT	ION FA	CTOR											+						
	-		NCY			ر ر (د سو.	(R)			_			T FILE		,,,,,,	/VV -					214	\cong	<u> </u>
INPUT FILE	(XX)	XXX	LINI	20	3.	117					.UU			. 🗤	.~^^		/	~	دں۔	ا . د .	ヽ゚ヿて		

EMC ENGINEE	DC TNC		FORM DENVER.	COLORAG
BUILDING NUMBER			DENVER.	CULURAL
P-2055				
SUPPLY AIR	OCCUPIED HOURS:		UNOCCUPIED HOURS:	
(ACFM)	COCOFIED HOOKS	(R)		
(// 1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	OCCUPIED HOURS:	(1)	UNOCCUPIED HOURS:	
MAX OA/SA RATIO		(R)		
	OCCUPIED HOURS:		UNOCCUPIED HOURS:	
MIN OA/SA RATIO		(R)		
	HEATING OCCUPIED HOURS		HEATING UNOCCUPIED HOURS	
APPROXIMATE	68.0	(R)	55.0	
RETURN AIR TEMP, *F	COOLING OCCUPIED HOURS		COOLING UNOCCUPIED HOURS	S
IEMP, F	78.0	(R)	120.0	
	DESIRED MIXED AIR TEMPERATUR	E, °F		
	O.O IF FIXED GA OR ZONE CONTROLLED	(R)		
		ER TYPES		
1			1	
İ				1
t				,
	HTG		HTG CLG TYPE 2-"SMART"	
]	TYPE 1 - "DUMB"		ITE C- SMARI	
			•	
			•	•
				•
				•
	•			
				. •
				. •
ELEVATION IN FE				

BUILDING--P-2055
CASE--ECO #14 - NIGHT SETBACK
DATE--11/20/92
PREPARED BY--AJN

******	BIN HEATING AND COOLING	******
******	LOADS REPORT	******
******	BUILDING BOUNDARY	******

J	BIN		HO	URS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
	F		7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
				•	MBTU	MBTU	MBTU	MBTU
-25	+0	-20	0	0	.0000	.0000	.0000	.0000
-20			Ö	0	.0000	.0000	.0000	.0000
		-10	Ö	0	.0000	.0000	.0000	.0000
-10		-5	Ö	2	.0000	.0780	.0000	.0000
-5	to	Õ	0	8	.0000	.2851	.0000	.0000
0	to	5	15	94	.4475	3.0262	.0000	.0000
5	to	10	17	121	.4456	3.5034	.0000	.0000
10	to	15	37	168	.8375	4.3208	.0000	.0000
15	to	20	55	303	1.0466	6.7769	.0000	.0000
20	to	25	97	376	1.4991	7.1463	.0000	.0000
25	to	30	112	486	1.3068	7.5692	.0000	.0000
30	to	35	94	353	.7579	4.3065	.0000	.0000
35	to	40	144	407	.6348	3.5667	.0000	.0000
40	to	45	135	493	.0821	2.4691	.0000	.0000
45	to	50	181 -	594	.0000	1.0133	.0000	.0000
50	to	55	175	556	.0000	.0000	.0000	.0000
55	to	60	178	563	.0000	.0000	.0000	.0000
60		65	192	621	.0000	.0000	.0000	.0000
65		70	210	521	.0000	.0000	.0000	.0000
70		75	193	327	.0000	.0000	2.4453	.0000
75		80	192	220	.0000	.0000	3.2830	.0000
80		85	163	114	.0000	.0000	3.8454	.0166
85		90	135	74	.0000	.0000	3.7363	.2578
90		95	15	19	.0000	.0000	.4698	.1295
95		100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
	ANN		2340	6420	7.0580	44.0616	13.7798	.4039

BUILDING--P-2055
CASE--ECO #14 - NIGHT SETBACK
DATE--11/20/92
PREPARED BY--AJN

ZONE # 1 CASE #1

*****	MONTHLY HEATING AND COOLING	3 **********
******	LOADS REPORT	******
******	BUILDING BOUNDARY	******

MONTH	MECH HEATIN	IG LOADS	MECH COOLI	NG LOADS 17 - 6
	MBTU	MBTU	MBTU	MBTU
01 JAN	1.8054	9.6462	.0000	.0000
02 FEB	1.6791	8.7179	.0000	.0000
03 MAR	.9112	6.4869	.0000	.0000
04 APR	.2123	2.5727	.0000	.0000
05 MAY	.0067	.6087	.8411	.0002
06 JUN	.0000	.0000	2.1950	.0260
07 JUL	.0000	.0000	4.1753	.3014
08 AUG	.0000	.0000	3.9276	.0529
09 SEP	.0009	.3440	2.6407	.0235
10 OCT	.0319	2.0616	.0000	.0000
11 NOV	1.3695	6.5307	.0000	.0000
12 DEC	1.0411	7.0929	.0000	.0000
ANN	7.0580	44.0616	13.7798	.4039

Building Boundary Energy per Square Foot of Total Building area = 31700.6 BTU

BUILDING--P-2055 ZONE # 1 CASE--ECO #14 - NIGHT SETBACK CASE #1 DATE--11/20/92 PREPARED BY--AJN

******	BIN SOLAR ENERGY REPORT	******
*****	DIRECT GAIN THROUGH	******
*****	WINDOWS AND SKYLIGHTS	******

BIN	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16
F		MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	15	.0444
5 to 10	17	.0556
10 to 15	37	.1326
15 to 20	55	.2142
20 to 25	97	.4078
25 to 30	112	.5056
30 to 35	94	.4535
35 to 40	144	.7395
40 to 45		.7351
45 to 50	181	1.0418
50 to 55	175	1.0616
55 to 60	178	1.1350
60 to 65	192	1.2838
65 to 70	210	1.4694
70 to 75	193	1.4103
75 to 80	192	1.4626
80 to 85	163	1.2922
85 to 90	135	1.1122
90 to 95	15	.1282
95 to 100	0	.0000
100 to 105	0	.0000
ANN	2340	14.6855

BUILDING--P-2055
CASE--ECO #14 - NIGHT SETBACK
DATE--11/20/92
PREPARED BY--AJN

ZONE # 1 CASE #1

MONTH	LIGHTS	MISC	PEOPLE	APPLIANC
	ELEC	ELEC		ELEC
	MBTU	MBTU	MBTU	MBTU
01 J	1.9934	.3808	.0964	3.2684
02 F	1.8615	.3595	.0918	2.9521
03 M	2.1116	.4109	.1056	3.2684
04 A	1.9692	.3787	.0964	3.1630
05 M	2.0525	.3959	.1010	3.2684
06 J	2.0283	.3937	.1010	3.1630
07 J	1.9934	.3808	.0964	3.2684
08 A	2.1116	.4109	.1056	3.2684
09 S	2.0283	.3937	.1010	3.1630
10 O	1.9934	.3808	.0964	3.2684
11 N	2.0283	.3937	.1010	3.1630
12 D	2.0525	.3959	.1010	3.2684
TOT	24.2241	4.6754	1.1934	38.4827
RAW SOURCE	82.3321	15.8905	1.1934	130.7937

BUILDING--P-2055 CASE--ECO #14 - NIGHT SETBACK7 DATE--11/20/92 PREPARED BY--AJN ALL ZONES CASE #1

*****	MONTHLY HEATING AND COOLING	******
*****	OUTSIDE AIR LOADS	******
******	BUILDING BOUNDARY	******

HEATING	COOLING
MBTU	MBTU
16.25033	.00000
	.00000
13.13235	.00000
7.48661	.00000
3.95883	.41637
.00000	.79845
.00000	.86842
.00000	.83901
1.76908	.82758
4.63137	.00000
12.93012	.00000
13.25437	.00000
88.46296	3.74983
	MBTU 16.25033 15.04990 13.13235 7.48661 3.95883 .00000 .00000 .00000 1.76908 4.63137 12.93012 13.25437

BUILDING--P-2055
CASE--ECO #14 - NIGHT SETBACK
DATE--11/20/92
PREPARED BY--AJN

ALL ZONES CASE #1

*****	MONTHLY HEATING	AND COOLING	*****
*****	RAW SOURCE	ENERGY	******
*****	CONSUMPTION	REPORT	******

MONTH		AL HEATING NAT GAS MBTU		L COOLING IAT GAS MBTU
01 J		43.9015		.0000
02 F		40.3278		.0000
03 M		32.5364		.0000
04 A		16.2783		.0000
05 M		7.2491		2.4139
06 J		.0000		5.7956
07 J		.0000		10.2594
08 A		.0000		9.2504
09 S		3.3502		6.7021
10 0		10.6574		.0000
11 N		33.0116		.0000
12 D		33.8959		.0000
ANN		221.2083		34.4214
BTU/SF/YR	HEATING:	107382.7	COOLING:	16709.4

Raw Source Energy per Square Foot of Total Building Area = 124092.1 BTU

TAB C-3 FORT CARSON ECONOMIZER CYCLES ECO #16

LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

	LOCATION: FORT	CARSON, COLO	RADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION			IOMIZER CYCLE		BUILDING:	P-1850
	ANALYSIS DATE:	06/24/93		ECONOMIC LIFE	:· 20	PREPARED BY:	
	AITALIOIO DAIL.	00/24/33		LOCITOWIO EI L	20	FALFARED DI.	A. NICWETCA
	VESTMENT COSTS						
	CONSTRUCTION COST		=			\$5,180	
	SIOH COST		(5.5% of 1A) =			\$285	
	DESIGN COST		(6.0% of 1A) =			\$311	
	TOTAL COST		(1A + 1B + 1C) =			\$5,776	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$5,776
2 EN	IERGY SAVINGS (+) or	COST (-)					
DA	TE OF NISTIR 85-3273-X L	JSED FOR DISCOU	NT FACTORS: C	OCTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	14.53	\$0	
В.	DIST			\$0	17.63	\$0	
C.	NAT GAS	\$3.48	223.06	\$775	18.59	\$14,414	
D.	COAL			\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
	DEMAND SAVINGS	\$69.68 / year		\$0	13.59	\$0	
G.	TOTAL		223.06	775.4		>	\$14,414
			•				
3 NC	DNENERGY SAVINGS ((+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVING	3S or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$0	• •	, ,	` `	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$0			\$0	
C.	TOTAL NONENERGY DIS	SCOUNTED SAVING	S or COST		(3A2 + 3Bd4) =	•-	\$0
					,		
4 SI	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		7.4
5 TO	TAL NET DISCOUNTE	D SAVINGS			(2G5 + 3C) =		\$14,414
6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)			(5/1G) =		2.50
7 AD	JUSTED INTERNAL RA	ATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/20 power - 1] x 100 =		8.87
				•••			

LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

	LOCATION: I	FORT CARSON, CO	LORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE	E: FT CARSON E	EAP UPDATE		FISCAL YEAR:	1992	
	DISCRETE POR	TION NAME:	BUILDING:	P-2359			
	ANALYSIS DATE	E: 06/24/93		ECONOMIC LIFE	: 20	PREPARED BY:	A. NIEMEYER
1 IN	ESTMENT COST	rs					
A.	CONSTRUCTION	COST	=			\$2,620	
В.	SIOH COST		(5.5% of 1A) =			\$144	
C.	DESIGN COST		(6.0% of 1A) =			\$157	
D.	TOTAL COST		(1A + 1B + 1C) =			\$2,921	A .
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE	OF EXISTING EQUIP.	=			\$0	
G.	TOTAL INVESTME	NT	(1D - 1E - 1F) =			>	\$2,921
2 EN	ERGY SAVINGS	(+) or COST (-)					
DA	TE OF NISTIR 85-32	73-X USED FOR DISCO	OUNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	14.53		
В.	DIST			\$0	17.63	\$0	
C.	NAT GAS	\$3.48	84.70	\$294	18.59	\$5,473	
D.	COAL			\$0	14.46	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVING	s \$69.68 / year		\$0	13.59	\$0	
G.	TOTAL	·	84.70	\$294		>	\$5,473
3 NC	NENERGY SAVII	NGS (+) or COST (-)					
A.	ANNUAL RECURR	ING				\$0	
	1 DISCOUNT FAC	TOR		(From Table A-2) =	13.59		
	2 DISCOUNTED S	AVINGS or COST		$(3A \times 3A1) =$		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	C.		\$0	0	0.00	\$0	
	d TOTAL		\$0			\$0	
C.	TOTAL NONENER	GY DISCOUNTED SAVI	NGS or COST		(3A2 + 3Bd4) =		.\$0
4 011	IDI E DAVO (o.c.	ODD) A/D=:					
	MPLE PAYBACK (1G/(2	(G3 + 3A + (3Bd1/20)) =		9.9
	TAL NET DISCOU				(2G5 + 3C) =		\$5,473
		TMENT RATIO (SIR)			(5/1 G) =		1.87
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%)				[(1+.04) x SIR to 1	/20 power - 1] x 100 =		7.32

LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

	LOCATION: FORT	T CARSON, COLO	RADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA		FISCAL YEAR:	1992		
	DISCRETE PORTION	BUILDING:	ALL BUILDINGS				
	ANALYSIS DATE:	06/30/93		OMIZER CYCLE ECONOMIC LIFE	• 20	PREPARED BY:	
	, , , , , , , , , , , , , , , , , , , ,	30,00,00		EGONOMIO EN E	. 20	THE ARES ST.	A. MEMETER
4 (A.D	/FOTHENT 000TO						
	VESTMENT COSTS						
	CONSTRUCTION COST		=			\$7,800	
-	SIOH COST		(5.5% of 1A) =			\$429	
	DESIGN COST		(6.0% of 1A) =			\$468	
	TOTAL COST		(1A + 1B + 1C) =			\$8,697	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF E	XISTING EQUIP.				\$0	**
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$8,697
2 EN	IERGY SAVINGS (+) or	r COST (-)					
DA	TE OF NISTIR 85-3273-X		NT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)		FACTOR (4)	• • •	
	ELEC	\$7.32		\$0	14.53	-	
	DIST			\$0	17.63	\$0	
	NAT GAS	\$3.48	307.76	\$1,070	18.59	\$19,887	
	COAL			\$0	14.46	\$0	
	SOLAR			\$0		\$0	
	DEMAND SAVINGS	\$69.68 / year		\$0	13.59	\$0	
G.	TOTAL		307.76	1,069.8		>	\$19,887
	DNENERGY SAVINGS	(+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	13.59		
	2 DISCOUNTED SAVIN	GS or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$0			\$0	
C.	TOTAL NONENERGY D	ISCOUNTED SAVING	SS or COST		(3A2 + 3Bd4) =		\$0
4 SI	MPLE PAYBACK (SPB)) - (YRS)		1G/(2G3 + 3A + (3Bd1/20)) =		8.1
5 TC	TAL NET DISCOUNTE	D SAVINGS			(2G5 + 3C) =		\$19,887
6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)			(5/1G) =		2.29
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%) [(1+.04) x SIR to 1/20 power - 1] x 100					1/20 power - 1] x 100 =		8.39

CONSTRUCTION COST ESTIMATE			DATE PREPARED 24-Jun-93 BASIS FOR			SHEET 1 OF 1 R ESTIMATE		
Project UPDATE EXISTING EEAP								
Location FORT CARSON, COLORADO Architect-Engineer				Code A (No desi Code B (Prelimit Code C (Final de	nary design)			
E M C ENGINEERS, INC., 2750 S. WA	DSWORTH	BLVD., D	ENVER, CO 802	27		Other (Specify)	,aigii) 👊	
Drawing No.		Estimate			Checked by T. FORSTER			
ECO #16 Economizer Cycle	Quan No. Units	tity Unit Meas.	Labor Per Unit	Total	Mater Per Unit	rial Total	Total Cost	
BLDG P-1850 (AHU-1 - Sanctuary)			i i	1 3 4 4 4				
Mixed Air Sensor	1	EA	13.85	13.85	138.32	138.32	\$152.17	
Economizer Logic Controller	1	EA	82.66	82.66	300.85	300.85	\$383.5	
Exhaust Air Damper (36"X48")	1	EA	91.24	91.24	288.50	288.50	\$379.74	
Wall Demolition for Exhaust Louver	1	EA	182.49	182.49			\$182.49	
Exhaust Air Louver (72" x 80")	1	EA	169.97	169.97	378.25	378.25	\$548.22	
Ductwork (36" x 48") - 15'	1	EA	891.83	891.83	650.45	650.45	\$1,542.28	
Electric Accuators	3	EA	16.53	49.60	83.98	251.94	\$301.54	
O.A. Temperature Transmitter	1	EA	13.85	13.85	138.32	138.32	\$152.17	
Note: Intake Air Louver appears to be pro	operly sized	for 100%	O.A.					
Subtotal - Direct Costs per Installation	, ,			370.24		727.66	3642.11	
Overhead, Bond, Ins. (16.8%)							\$611.87	
Workers Comp. Ins. (7.3%)				•			\$27.03	
Profit (10%)							\$428.10	
Contingency (10%)							\$470.91	
TOTAL						-	\$5,180.02	
BLDG P-2359 (AHU-2 - Office Area)								
Mixed Air Sensor	1	EA	13.85	13.85	138.32	138.32	\$152.17	
Economizer Logic Controller (Pneumatic)	1	EA	82.66	82.66	300.85	300.85	\$383.51	
Ductwork Demolition	1	EA	41.33	41.33	-		\$41.33	
Ductwork (24" x 28") - 8'	1	EA	185.99	185.99	134.57	134.57	\$320.56	
Outside Air Damper (24"x28")	1	EA	27.55	27.55	54.59	54.59	\$82.13	
Exhaust Air Damper (24"x28")	1	EA	27.55	27.55	54.59	54.59	\$82.13	
Wall Demolition for Intake Louver	1	EA	91.24	91.24			\$91.24	
Intake Air Louver (36" x 40")	1	EA	84.99	84.99	123.25	123.25	\$208.24	
O.A. Temperature Transmitter	1	EA	13.85	13.85	138.32	138.32	\$152.17	
Electric Accuators	3	EA	16.53	49.60	83.98	251.94	\$301.54	
Subtotal - Direct Costs per Installation				618.60		1196.42	1815.02	
Overhead, Bond, Ins. (16.8%)							\$304.92	
Workers Comp. Ins. (7.3%)							\$45.16	
Profit (10%)							\$216.51	
Contingency (10%)							\$238.16	
TOTAL							\$2,619.77	
TOTAL FOR ECO #16							\$7,799.79	
			,					
	. 1					I		

			_	BC	EP IN	PUT	FOR			001.001.00
EMC ENG				7,417,72,017, TA	- 1	· · · · · · · · · · · · · · · · · · ·				COLORADO (XBINXX.XX)
	(n li	XISTING INP		XXXXXX.IN	,			FCBIA		(XBINXX.XX)
EXISTING (/850		CA	SE DESCRIPTION	N (20 CH4	AR)		r ECM #	DATE (mm/dd/yy)
Frcarson					ASELINE				Φ	4/13/93
PREPARED BY:		(6C) BUILD			TOTAL FLOOP		R) # 0	F ZONES Z	ONE NUMBE	R FAN
AJN		1 1	1850		5217		_	$\int_{-\infty}^{\infty} \omega$	1	(I) SYSTEM N
HEATING	МО		_		2) DD CORR. I		UEL TYP		CAPACITY	2 MIN
202210101		9) <u>`</u>		EFFICIENCY	3 71 1		00,000 (R	2
PART LOAD I	1 2	3 4	5 6 7		"	POINTS (R) 0.630	1/3	' ' '	
	MO	NTH ON GOO	-12) MONTH	10FF (01-1	2)		UEL TYP		CAPACITY	# PART LOAD PTS.
COOLING		5	ω	9	(i)		3	(1) 1,00	0,000 (R	2 2 MIN
PART LOAD	2	3 4	5 6 7	8 9	ЮШ	EFFICIENC		. 1. 1. 1.	5 6 7	8 9 10 11
POINTS 0		11				POINTS		52		
BIN Nº HEATIN	G BEGU		BIN Nº COC		1	HEAT NON		• 1	COOL NON-	-WORK HOURS?
/7		(I)	IS ZONE ?		(1)	<u> </u>	, ,		RAD DISK F	
CONDUCTI	ON		Y) N					Sc	LAROL	JE
		NORT	гн	E	WAL AST	LS SOUT	н	WE:	s r	ROOF
AREA	(R)	1						112		5722.0
		796	-0	1	7/3.0	<i>8</i> 8°	<u>r.0</u>			
U-VALUE	(R)	0.12	9	0.	129	0.1.	29	0.1	29	0.09
COLOR ADJUS FACTOR	TMENT (R)	0.8	3	Ó.	83	0.8	33	0.8	33	0.65
CLTD	(1)	410)	4	95	4	71	40	6	702
EXTERNAL SI FACTOR	HADE (R)	0.	9	/,	0	10	0 '	0.0	5-	0.9
		ILATION ?			POSSIBLE SU	MMER SUN	SHINE			NTER SUNSHINE (R)
<u> </u>	<u>/</u>	N			67.0	i)	,	R) 66.	5	SKYLIGHT or ROOF
		N	NE	E	SE	<u> </u>	SW	w	NW	GLASS
AREA	(R)		88.0			·				63.0
U-FACTOR	(R)		0.568							6. 568
SHADING COEFFICIENT	(R)		0.88							0.88
COOLING LOAD FACTOR	D (R)		5.2		·			·		8.23
MAX SHGF, SUMMER	(1)		163				ļ			262
MAX SHGF, WINTER	(1)		20							/33
EXTERNAL SH FACTOR	(R)		0.0	<u> </u>						1,0
FLOOR O NONE	(2)	FLOOR ARE			UE CRAWL S	PACE TEMI		E EXPO		AETER LENGTH
TEMP RANGE	<u>"- </u>						ATING TE	MPERATURE	SPACE COO	LING TEMPERATURE (R)
30 (· · · · · · · · · · · · · · · · · · ·	s 91,0) <u> </u> W	-3:0	060.0	<u> I</u> N	60.0	0 75.0	' IN 0.0
CONVECTION	N X	ELEVATION 5840			FM(R)		HEAT	TING AIR TEMP		XUNG AIR TEMP (R)
INTERNAL		RUN THIS ZO	NE ? Nº of	TYPES?		INTE	RNAL G	UNS TYPES		
GAINS		Y N		(1)	DHW (I)	LIGHT	IS (2)	APPLIANCES (3.	MISC.	(4) PEOPLE (5)
, 04V-	FUEL			(I)	127/ -	1		26024	12 73	250 2555
DAY:		/ UNIT	3	(1)	1276.0	252	90.0	<u> 30034.(</u>	12/3	3570 <u>25570</u> 11
		LOAD FACT		(R)	0.01	1 -	اا	0.5	 	
		DAD FACT			0.01	0.	5	0.024	0,3	
NIGHT:		/UNIT		(R)			35 290 ₀ 0	30034,0	/273	
		ER OF UNIT	s	(1)	1276.0	1234	- 1010	1	1	-10 23340
		E LOAD FAC		(R)	0.01	0.	5	0-5	0.0	1.0
		DULE CORR			0.0	0.	1	0.024	0.39	
		CIENCY		(R)	100.0	100		100.0	100.	
INPUT FILE			1850B		<u> </u>		UT FILE			OB. RPT
1 O			03013	۷۱۷					,,,,	<u> </u>

	VBCE	P INPUT	FORM			
EMC ENGINEER	S. INC.		DENVER_C	COLORADO		
BUILDING NUMBER						
SUPPLY AIR	OCCUPIED HOURS:		UNOCCUPIED HOURS:			
(ACFM)	6255.0	(R)	6255.0	(R)		
MAX OA/SA RATIO	OCCUPIED HOURS:	(R)	O. /5	(R)		
MIN OA/SA RATIO	OCCUPIED HOURS:	(R)	UNOCCUPIED HOURS:	(R)		
APPROXIMATE RETURN AIR	HEATING OCCUPIED HOURS	(R)	HEATING UNOCCUPIED HOURS	(R)		
TEMP, *F	75.0	(R)		(R)		
	DESIRED MIXED AIR TEMPERATUR	RE, °F 0.0 (R)				
	ECONOMI:	ZER TYPES				
TYPE 1 - "DUMB" TYPE 2 - "SMART"						

ELEVATION IN FEET (R) 5840.

DEBUG

1 = MONTHLY MIXED AIR REPORT BY BIN INCREMENT

REPORT

2: ANNUAL REPORT BY MONTH

<u>C3-6</u>

BUILDING--1850B CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN

*****	BIN HEATING	AND COOLING	******
******	LOADS	REPORT	*****
******	BUILDING	BOUNDARY	*******

]	BIN		HO	URS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
	F		7-17	18- 6	7 - 17	18 - 6	7 - 17	18 - 6
					MBTU	MBTU	MBTU	MBTU
-25			0	0	.0000	.0000	.0000	.0000
-20		-15	0	0	.0000	.0000	.0000	.0000
-15	to	-10	0	0	.0000	.0000	.0000	.0000
-10	to	-5	0	2	.0000	.1524	.0000	.0000
-5	to	0	0	8	.0000	.5580	.0000	.0000
0	to	5	19	90	1.0331	5.6818	.0000	.0000
5	to	10	28	110	1.3373	6.2868	.0000	.0000
10	to	15	52	153	2.1514	7.8277	.0000	.0000
15	to	20	85	273	2.9664	12.2230	.0000	.0000
20	to	25	160	313	4.5488	12.0270	.0000	.0000
25	to	30	183	415	3.9844	13.1700	.0000	.0000
30	to	35	155	292	2.3598	7.3785	.0000	.0000
35	to	40	213	338	1.7991	6.3537	.0000	.0000
40	to	45	213	415	.3308	4.7283	.0000	.0000
45	to	50	266	509	.0000	2.5183	.0000	.0000
50	to	55	274	457	.0000	.0459	.0000	.0000
55	to	60	271	470	.0000	.0000	.0000	.0000
60	to	65	302	511	.0000	.0000	.0000	.0000
65	to	70	359	372	.0000	.0000	.0000	.0000
70	to	75	318	202	.0000	.0000	7.8788	.0000
75	to	80	311	101	.0000	.0000	10.4600	.0000
80	to	85	227	50	.0000	.0000	10.0260	.0000
85	to	90	182	27	.0000	.0000	9.3773	.0000
90	to	95	32	2	.0000	.0000	1.8392	.0000
95	to	100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
	ANN		3650	5110	20.5109	78.9515	39.5813	.0000

BUILDING--1850B CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY HEATING AND COOLING	******
*****	LOADS REPORT	*****
*****	BUILDING BOUNDARY	*****

MONTH	MECH HEATI	NG LOADS	MECH COOL	ING LOADS
	7 - 17	18 - 6	7 - 17	18 - 6
	MBTU	MBTU	MBTU	MBTU
01 JAN	5.1888	16.7490	.0000	.0000
02 FEB	4.8721	14.8820	.0000	.0000
03 MAR	3.0119	11.0930	.0000	.0000
04 APR	.4475	5.1263	.0000	.0000
05 MAY	.0120	1.5139	2.9435	.0000
06 JUN	.0000	.0000	5.5254	.0000
07 JUL	.0000	.0000	13.1410	.0000
08 AUG	.0000	.0000	10.6770	.0000
09 SEP	.0082	.7263	7.2949	.0000
10 OCT	.3084	4.0165	.0000	.0000
11 NOV	3.4525	12.0830	.0000	.0000
12 DEC	3.2095	12.7610	.0000	.0000
ANN	20.5109	78.9515	39.5813	.0000

Building Boundary Energy per Square Foot of Total Building area = 26652.0 BTU

BUILDING--1850B CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN

******	BIN SOLAR ENERGY REPORT	******
******	DIRECT GAIN THROUGH	******
******	WINDOWS AND SKYLIGHTS	******

BIN	HOURS 7-17	SOLAR DIRECT GAIN 7 - 17 MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	19	.0589
5 to 10	28	.0948
10 to 15	52	.1908
15 to 20	85	.3361
20 to 25	160	.6781
25 to 30	183	.8276
30 to 35	155	.7451
35 to 40	213	1.0845
40 to 45	· ······· · · · · · · · · · · · · · ·	1.1451
45 to 50	266	1.5056
50 to 55	274	1.6288
55 to 60	271	1.6881
60 to 65	302	1.9670
65 to 70	359	2.4404
70 to 75	318	2.2521
75 to 80	311	2.2910
80 to 85	227	1.7368
85 to 90	182	1.4442
90 to 95	32	.2630
95 to 100	0	.0000
100 to 105	0 ·	.0000
ANN	3650	22.3781

BUILDING--1850B CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN

*****	MONTHLY	INTERNAL GAINS	REPORT:	*****
*****	LOADS	AND RAW SOURCE	ENERGY	*****
*****		CONSUMPTION		*****

MONTH	DHW	LIGHTS	APPLIANC	MISC	PEOPLE
	ELEC	ELEC	ELEC	ELEC	
	MBTU	MBTU	MBTU	MBTU	MBTU
01 J	.3956	3.6848	.5363	3.5546	.8695
02 F	.3573	3.3282	.4844	3.2106	.7854
03 M	.3956	3.6848	.5363	3.5546	.8695
04 A	.3828	3.5659	.5190	3.4400	.8415
05 M	.3956	3.6848	.5363	3.5546	.8695
06 J	.3828	3.5659	.5190	3.4400	.8415
07 J	.3956	3.6848	.5363	3.5546	.8695
08 A	.3956	3.6848	.5363	3.5546	.8695
09 S	.3828	3.5659	.5190	3.4400	.8415
10 0	.3956	3.6848	.5363	3.5546	.8695
11 N	.3828	3.5659	.5190	3.4400	.8415
12 D	.3956	3.6848	.5363	3.5546	.8695
TOT	4.6578	43.3850	6.3143	41.8531	10.2382
RAW SOURCE	15.8307	147.4556	21.4610	142.2489	10.2382

BUILDING--1850B CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ALL ZONES CASE #0

******	MONTHLY HEATING AND COOLING	******
******	OUTSIDE AIR LOADS	******
******	BUILDING BOUNDARY	******

MONTH	HEATING MBTU	COOLING MBTU						
	11510	HBIO						
01 JAN	20.25799	.00000						
02 FEB	18.45627	.00000						
03 MAR	14.83027	.00000						
04 APR	7.75475	.00000						
05 MAY	3.78196	.10671						
06 JUN	.00000	.56227						
07 JUL	.00000	2.30242						
08 AUG	.00000	1.26818						
09 SEP	2.09311	.91933						
10 OCT	5.83402	.00000						
11 NOV	15.08473	.00000						
12 DEC	15.29199	.00000						
ANN	103.38510	5.15889						

BUILDING--1850B CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ALL ZONES CASE #0

*****	MONTHLY HEATING	AND COOLING	******
******	RAW SOURCE	ENERGY	******
******	CONSUMPTION	REPORT	******

MONTH		AL HEATING NAT GAS MBTU	_ _	AL COOLING NAT GAS MBTU
				
01 J		66.8716		.0000
02 F		60.5551		.0000
03 M		45.8568		.0000
04 A		21.1228		.0000
05 M		8.4118		5.8545
06 J		.0000		11.6846
07 J		.0000		29.6413
08 A		.0000		22.9270
09 S		4.4813		15.7663
10 O	•	16.0997		.0000
11 N		48.5265		.0000
12 D		49.5442		.0000
ANN	·· ··· <u>· · ·</u>	321.4698		85.8737
BTU/SF/YR	HEATING:	61619.7	COOLING:	16460.4

Raw Source Energy per Square Foot of Total Building Area = 78080.0 BTU

EMC EN	21 NEE	:DC	TN	r			B	CE	P	- 11	۷F	PUT	F	OF	₹N	N	. 1)FN	VFR) 1	COL	ORAE	nn .	
CASE TYPE					,, E	700	XXXX.	N I	100	- Chi	7		_		-	SIN CHA		_						
NEW	(1)						^^^	14,					-		Ι,	AIT (4 17						w	•	
EXISTING O			50		110	<u>e</u>	1 6	ASF	nes	CRIP	TIO	N (20 C	HAR)			CASE	or F	CM #		DAT	E (mm	/dd/v	(v)
PROJECT	LJUNIF		(20 Ci	17417				–		-		CY				. [J. J.		· · ·		1 .	//3		•
PREPARED BY		(6C)	BUILD	ING I	VAME:								(R)		OF Z	ONES		ZONE	NUA	ABER		FAN		<u>} </u>
PREPARED DI			•														w			(₍₎ s1	STEN	4 1	Ň
HEATING	MC	MTH	ON (OC	(ı)	MON	тн о	FF (OI	(1)	DD	CORR	. FA	CTOR (R)	FU	EL TY	PE	(1)	EQP	T. C	APACI	TY (R)	# P/	ART LO	2 1	
PART LOAD I	2	3	4	5	6	7	8	9	10	11		FFICIEN	CY (R)	l	2	3	4	5	6	7	8	9	10	11
COOLING	MO	NTH	ON (O)-12) (1)	MON	тно	FF (01	-12) (1)			-1	,	FUI	EL TY	PE	(1)	EQP	T. CA	PACI	ry (R)	# P	ART L	OAD F	IIN
PART LOAD I	2	3	4	5	6	7	8	9	10	11		FFICIEN	NCY	í	2	3	4	5	6	7	8	9	_	11
BIN Nº HEATIN	IG BEGI	NS	4	BIN	N ₅ C	00L	NG BE	GINS	3		- 1	HEAT N				URS ?		coc	OL N		VORK	HOUR	s?	1
CONDUCT	ION		(i) RUN T			?	1			(1)		`	<u> </u>		N	S	OLAR	RAI						
CONDOCT		一		<u>. Y</u>	<u> </u>					W	ALL	s								\neg				
AREA	(R)	-	NOR	ТН		Т		EAS	T		Т	SOL	ЛН			Ι	WE	ST		+		ROOF	=	
U-VALUE	(R)	-		- , -		+		•			+					-				\dashv				•
COLOR ADJUS						╁					\dagger					<u> </u>				\dagger				-
CLTD	(1)					\dagger					\dagger									\top				
EXTERNAL S	HADE (R)					1					T									T				
ATTI	VENT	ILATI	ON 7			F	PERCENT POSSIBLE SUMMER SUNSHINE				(R)	PERC	ENT	POSS	IBLE	WIN	TER S	UNSHI	INE	(R)				
			N		NE		GL E	ASS	(VI	ERTIC E	AL) S		sw		w	,		NW	15	KYLI	GHT o		0F
AREA	(R)																							
U-FACTOR	(R)																							
SHADING COEFFICIENT																				\perp				
COOLING LOA FACTOR	D (R)	·				\perp		\perp			L		\perp					_		1				
MAX SHGF, SUMMER	(1)			_		_		_			ļ		1				<u></u>	Ļ		_				
MAX SHGF, WINTER	(1)					\perp					Ļ		4			ļ				\bot				
FACTOR	(R)				17-1-			<u></u>	1	A144* *		105 ==		D. 4 = 1 -	05	<u> </u>	lev-				TES	(6)6	TLI	
FLOOR O NON TYPE 2 CRA	ML (2)	FLOC	OR ARE	(R)			-	(R)	s			ACE TE	W			(R)						LENG		(R)
TEMP RANGE	1)			DE S			14	•			ם		EAT	Į,	1			Đ			Įŧ	V		
CONVECTION	ON Y	ELE	VATIO	٧	A	IR FL	LOW R		i-00 I(R)		/ UN	ACF	M(R)	D		G AIR '	N		(R) (–	ING A	IR TEI IN	MP	(R)
INTERNAL GAINS	F	UN T	HIS Z		Š M _δ	of T	YPES ? ()		DH	iW ((1)				_	S TYP		3)	MIS	C.	(4)	PEO	PLE	(5)
	FUEL	TYPE					(1)	T														\geq	~	
DAY:	втин	/ UNI	т				(Fd)	T							Г									
	NUMBE	R OF	UNIT	S			(1)	T	•						Г									
	SPACE	LOA	D FAC	TOR			(R)	1										1			.			
	SCHED				N FA	CTOR	(R)	+							Π			十			_			
NIGHT:	ВТИН						(R)	+			-				\vdash			\top			_			
mont.			UNIT	~			(1)	+				 			+	•		+-		····	-			
			AD FA				(R)	+		÷		 			-			+						
						VCTC		-							+-			+-			\dashv			
			CORR	2011	UN PA	4.10		+							-			+-			\dashv	_	=	_
	EFF			0	- n	, .	(R)	1_	-				TC: ~	r e:: '	<u></u>	V V V V .	, vv -		, ,)		<u> </u>		
INPUT FILE	TXXXX	XX.I	N) /	ک پسر ہ	$\sim OL$	ا د	1-16					QUI	וטאו	rill	. (XXXX	AX.R	r 17	18	457	nK.	RIG		1

	VBCEP IN	IPUT	FORM		
EMC ENGINEERS	S. INC.		DENVER, COLORADO		
BUILDING NUMBER					
P-1850B					
SUPPLY AIR	OCCUPIED HOURS:		UNOCCUPIED HOURS:		
(ACFM)		(R)		(R)	
MAX OA/SA RATIO	OCCUPIED HOURS:		UNOCCUPIED HOURS:		
MAX UA73A KATTU	0.95	(R)	0.95	(R)	
MIN OA/SA RATIO	OCCUPIED HOURS:		UNOCCUPIED HOURS:		
MIN UAZSA RATIO	0.10	(R)	0.10	(R)	
	HEATING OCCUPIED HOURS		HEATING UNOCCUPIED HOURS		
APPROXIMATE		(R)		(R)	
RETURN AIR TEMP, •F	COOLING OCCUPIED HOURS		COOLING UNOCCUPIED HOURS	1	
1,000		(R)		(R)	
	DESIRED MIXED AIR TEMPERATURE, "F				
	O.O IF FIXED OA OR ZONE CONTROLLED	(R)			
	ECONOMIZER T	YPES	•		
TYPE 1 - "DUMB" TYPE 2-"SMART"					
				}	

ELEVATION IN FEET (R) 5840

DEBUG 1 = MONTHLY MIXED AIR REPORT BY BIN INCREMENT
REPORT 2 = ANNUAL REPORT BY MONTH C3-14

BUILDING--1850B CASE--ECONOMIZER CYCLE DATE--4/13/93 PREPARED BY--AJN

******	BIN HEATING AND COO	LING ***********
******	LOADS REPORT	***********
*****	BUILDING BOUNDAR	Y ************

BIN	HO	JRS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
F	7-17	18- 6	7 - 17	18 - 6	7 - 17	18 - 6
			MBTU	MBTU	MBTU	MBTU
-25 to -20	0	0	.0000	.0000	.0000	.0000
-20 to -15	0	0	.0000	.0000	.0000	.0000
-15 to -10	0	0	.0000	.0000	.0000	.0000
-10 to -5	0	2	.0000	.1524	.0000	.0000
-5 to 0	0	8	.0000	.5580	.0000	.0000
0 to 5	19	90	1.0331	5.6818	.0000	.0000
5 to 10	28	110	1.3373	6.2868	.0000	.0000
10 to 15	52	153	2.1514	7.8277	.0000	.0000
15 to 20	85	273	2.9664	12.2230	.0000	.0000
20 to 25	160	313	4.5488	12.0270	.0000	.0000
25 to 30	183	415	3.9844	13.1700	.0000	.0000
30 to 35	155	292	2.3598	7.3785	.0000	.0000
35 to 40	213	338	1.7991	6.3537	.0000	.0000
40 to 45	213	415	.3308	4.7283	.0000	.0000
45 to 50	266	509		2.5183		.0000
50 to 55	274	457	.0000	.0459	.0000	.0000
55 to 60	271	470	.0000	.0000	.0000	.0000
60 to 65	302	511	.0000	.0000	.0000	.0000
65 to 70	359	372	.0000	.0000	.0000	.0000
70 to 75	318	202	.0000	.0000	7.8788	.0000
75 to 80	311	101	.0000	.0000	10.4600	.0000
80 to 85	227	50	.0000	.0000	10.0260	.0000
85 to 90	182	27	.0000	.0000	9.3773	.0000
90 to 95	32	2	.0000	.0000	1.8392	.0000
95 to 100	0	0	.0000	.0000	.0000	.0000
100 to 105	0	0	.0000	.0000	.0000	.0000
ANN	3650	5110	20.5109	78.9515	39.5813	.0000

BUILDING--1850B CASE--ECONOMIZER CYCLE DATE--4/13/93 PREPARED BY--AJN ZONE # 1 CASE #1

******	MONTHLY HEATING AND COOLING	******
*****	LOADS REPORT	******
*****	BUILDING BOUNDARY	******

MONTH MECH HEA 7 - 17		NG LOADS 18 - 6	MECH COOLII 7 - 17	NG LOADS 18 - 6
	MBTU	MBTU	MBTU	MBTU
01 JAN	5.1888	16.7490	.0000	.0000
02 FEB	4.8721	14.8820	.0000	.0000
03 MAR	3.0119	11.0930	.0000	.0000
04 APR	.4475	5.1263	.0000	.0000
05 MAY	.0120	1.5139	2.9435	.0000
06 JUN	.0000	.0000	5.5254	.0000
07 JUL	.0000	.0000	13.1410	.0000
08 AUG	.0000	.0000	10.6770	.0000
09 SEP	.0082	.7263	7.2949	.0000
10 OCT	.3084	4.0165	.0000	.0000
11 NOV	3.4525	12.0830	.0000	.0000
12 DEC	3.2095	12.7610	.0000	.0000
ANN	20.5109	78.9515	39.5813	.0000

Building Boundary Energy per Square Foot of Total Building area = 26652.0 BTU

BUILDING--1850B CASE--ECONOMIZER CYCLE DATE--4/13/93 PREPARED BY--AJN

*****	BIN SOLAR ENERGY REPORT	*****
*****	DIRECT GAIN THROUGH	******
*****	WINDOWS AND SKYLIGHTS	******

BIN	HOURS 7-17	SOLAR DIRECT GAIN 7 - 17
F		MBTU
-25 to -20	0	.0000
20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	19	.0589
5 to 10	28	.0948
10 to 15	52	.1908
15 to 20	85	.3361
20 to 25	160	.6781
25 to 30	183	.8276
30 to 35	155	.7451
35 to 40	213	1.0845
40 to 45	213	1.1451
45 to 50	266	1.5056
50 to 55	274	1.6288
55 to 60	271	1.6881
60 to 65	302	1.9670
65 to 70	359	2.4404
70 to 75	318	2.2521
75 to 80	311	2.2910
80 to 85	227	1.7368
85 to 90	182	1.4442
90 to 95	32	.2630
95 to 100	0	.0000
100 to 105	0	.0000
	2650	22.2701
ANN	3650	22.3781

BUILDING--1850B CASE--ECONOMIZER CYCLE DATE--4/13/93 PREPARED BY--AJN

******	MONTHLY	INTERNA	L GAINS	REPORT:	******
******	LOADS	AND RAW	SOURCE	ENERGY	******
******		CONSU	MPTION		******

MONTH	DHW	LIGHTS	APPLIANC	MISC	${ t PEOPLE}$
	ELEC	ELEC	ELEC	ELEC	
	MBTU	MBTU	MBTU	MBTU	MBTU
01 J	.3956	3.6848	.5363	3.5546	.8695
02 F	.3573	3.3282	.4844	3.2106	.7854
03 M	.3956	3.6848	.5363	3.5546	.8695
04 A	.3828	3.5659	.5190	3.4400	.8415
05 M	.3956	3.6848	.5363	3.5546	.8695
06 J	.3828	3.5659	.5190	3.4400	.8415
07 J	.3956	3.6848	.5363	3.5546	.8695
08 A	.3956	3.6848	.5363	3.5546	.8695
09 S	.3828	3.5659	.5190	3.4400	.8415
10 O	.3956	3.6848	.5363	3.5546	.8695
11 N	.3828	3.5659	.5190	3.4400	.8415
12 D	.3956	3.6848	.5363	3.5546	.8695
TOT	4.6578	43.3850	6.3143	41.8531	10.2382
RAW SOURCE	15.8307	147.4556	21.4610	142.2489	10.2382

BUILDING--1850B CASE--ECONOMIZER CYCLE DATE--4/13/93 PREPARED BY--AJN ALL ZONES CASE #1

******	MONTHLY HEATING AND COOLING	******
*****	OUTSIDE AIR LOADS	*****
******	BUILDING BOUNDARY	******

MONTH	HEATING MBTU	COOLING MBTU
	MBIO	MBIO
01 JAN	13.50532	.00000
02 FEB	12.30418	.00000
03 MAR	9.88685	.00000
04 APR	5.16984	.00000
05 MAY	2.52130	.07114
06 JUN	.00000	.37484
07 JUL	.00000	1.53494
08 AUG	.00000	.84545
09 SEP	1.39540	.61288
10 OCT	3.88935	.00000
11 NOV	10.05649	.00000
12 DEC	10.19466	.00000
ANN	68.92340	3.43926

BUILDING--1850B CASE--ECONOMIZER CYCLE DATE--4/13/93 PREPARED BY--AJN

ALL ZONES CASE #1

*****	MONTHLY HEATING	AND COOLING	*****
*****	RAW SOURCE	ENERGY	******
*****	CONSUMPTION	REPORT	*****

MONTH	тот	AL HEATING NAT GAS MBTU	_ - -	AL COOLING NAT GAS MBTU
01 J		56.1701		.0000
01 5 02 F		50.8053		.0000
03 M		38.0226		.0000
04 A		17.0263		.0000
05 M		6.4140		5.7862
06 J		.0000		11.3248
07 J		.0000		28.1682
08 A		.0000		22.1156
09 S		3.3756		15.1781
10 O		13.0178		.0000
11 N	1	40.5578		.0000
12 D		41.4660		.0000
ANN		266.8554	<u></u>	82.5730
BTU/SF/YR	HEATING:	51151.1	COOLING:	15827.7

Raw Source Energy per Square Foot of Total Building Area = 66978.8 BTU

	2001			BC	EP.	INF	PUT	FOR	M			
EMC ENG	INEE	RS, IN	С.		127				. [ENVER,		
CASE TYPE NEW	(ULI		UT FILE (XXXXXX.IN	1	T			BIN CHART FO		(XBINXX	.XX)
EXISTING C		2359/		L CA	SE DESCR	IPTIO	1 (20 CH	ARI	FCBIA)	I DATE	(mm/dd/yy)
FT CARSON					BASE			AR/	· CASE	Ø		/13/93
PREPARED BY:		(ac) BUILD	NG NAME:	(ec)	TOTAL FI			R) # 0F	ZONES Z	ONE NUMBE	R .FA	N (P)
AJN			- <u>235°</u>		346				/ w	/	(I) SYS	
HEATING	МО	nth on (od 9)-12) MONTI		1)	1.0	(R)	TUEL TYPE	(1)	CAPACITY	, 2	
PART LOAD I POINTS (R)	7.50		5 6 7	8 9		P		R) 63 L	63	5 6 7		9 10 11
COOLING	MOI	NTH ON GOO	(I) MONT	a	2) (1)			FUEL TYPE		r. capacity 00,000 (r	1	RT LOAD PTS. 2 MIN 11 MAX
PART LOAD POINTS O,	2 } [1.0	1 1 1	5 6 7	8 9	10 11	P	FFICIENC OINTS	52 .	52	5 6 7	8	9 10 11
BIN Nº HEATING	G BEGIN	(I)	BIN Nº CO			(1)	HEAT NOI	V-WORK H		COOL NON	N	OURS?
CONDUCTI	ON	RUN TI	HIS ZONE ?						SOLAR Solar	RAD DISK F SLAR+1	JE: JE	
		NOR'	Гн	Ε	AST	WALL	.s 	TH	WE	ST	F	ROOF
AREA	(R)	773	3.0	57	37.2		72	8.5	1290	8.8	40	35.4
U-VALUE	(R)	0.1	29	0.	129	\bot	0.1	<u> 29</u>	6.1	129		109
COLOR ADJUS FACTOR	(R)	0.8	3	1	83	_ -		<i>83</i>	0.		E	0.5
CLTD EXTERNAL SH	(I)	41	٥		95	\perp	4		40)6	70	05
FACTOR	(R)	1.	0	1	.5			75 '	//	OSSIBLE WI		, 0
ATTIC		LATION ?		PERCENT	POSSIBL	67.		SHINE (R		66.0		(R)
		N	NE	GL/ E	SS (VER	TICAL) S	SW	w	NW		TO ROOF
AREA	(R)		261,4		192	0	-	253	3	132.0		
U-FACTOR	(R)		0,68		0.56	3		0.84	7	0,568		
SHADING COEFFICIENT	(R)		0.9	ļ	0.88	3		0.94		0,88		
COOLING LOAD	(14)		5,2		6.2			6.2	<u> </u>	5,2	-	
MAX SHGF, SUMMER	(1)		163		170	_		170	-	163		···
MAX SHGF, WINTER EXTERNAL SH	(I)	-	20		241	\perp		241	-	20		
FACTOR	(R)	FLOOR ARE	0,0 A (2)FL	OOR U-VAL	O.3		ACE TEM	O,5 PERATURE	EXP	0,9	ETER LI	ENGTH
FLOOR O NONE TYPE 2 CRAW	P L	. WON ARE	(R) 0	,36	(R) S		— I	N	- (R) Z	203.0		(R)
TEMP RANGE	,		DESIGN D		RATURE -3.0		PACE HE	ATING TEI	70,0	D 75.0	LING TEM	PERATURE (R)
CONVECTIO	ON X	ELEVATION 5840	AIR	FLOW RAT	FM(R)		ACFN	(R) D			UNG AIR ひ・〇	TEMP (R)
INTERNAL GAINS	R	UN THIS ZO	DNE ? Nº o	f TYPES ? (i)	DHW	(1)			ns types Ppliances (3	MISC.	(4)	PEOPLE (5)
li de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	FUEL			(1)	1			1 1		1 2010		<u> </u>
DAY:	STUH.	R OF UNIT		(R)	549.	<u>م</u>	26,9	163,0		8914	7.5	<u>255.0</u> 8
		LOAD FACT		(R)	0,0	1		5		0,0		1.0
			CTION FAC		1,0			5		0.3		0.75
NIGHT:	втин			(R)	549			963.0		891		255,0
	NUMBE	ER OF UNIT	S	(1)						1		1
	SPACE	LOAD FAC	CTOR	(R)	0,0	1	0.5	2		0.0		1.0
			ECTION FAC		0.0		0.			0,3	_	0.25
		CIENCY		(R)	100.	0		0.0		100		<u>~</u>
INPUT FILE (XXXXXX.IN) 2359A.TN GUTPUT FILE (XXXXXX.RPT) 2359A.RPT												

VBCEP INPUT FORM						
EMC ENGINEER	EMC ENGINEERS, INC. DENVER, COLORADO					
BUILDING NUMBER						
P-2359A						
SUPPLY AIR	OCCUPIED HOURS:		UNOCCUPIED HOURS:			
(ACFM)	3445.0	(R)	3445.0	(R)		
	OCCUPIED HOURS:		UNOCCUPIED HOURS:			
MAX OA/SA RATIO	0.15	(R)	0.15	(R)		
	OCCUPIED HOURS:		UNOCCUPIED HOURS:			
MIN OA/SA RATIO	0.15	(R)	0.15	(R)		
	HEATING OCCUPIED HOURS		HEATING UNOCCUPIED HOURS			
APPROXIMATE	70.0	(R)	70-0	(R)		
RETURN AIR TEMP. *F	COOLING OCCUPIED HOURS		COOLING UNOCCUPIED HOURS			
IEMF, F	75.0	(R)	75.0	(R)		
	DESIRED MIXED AIR TEMPERATURE, "F					
	0.0 IF FIXED OA OR ZONE CONTROLLED	(R)				
	ECONOMIZER TY	PES				
TYPE 1 - "DUMB" TYPE 2-"SMART"						

ELEVATION IN FEET (R) 5840

DEBUG 1 = MONTHLY MIXED AIR REPORT BY BIN INCREMENT
REPORT 2 = ANNUAL REPORT BY MONTH C3-22

BUILDING--2359A CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ZONE # 1 CASE #0

*****	BIN HEATING	AND COOLING	******
*****	LOADS	REPORT	******
******	BUILDING	BOUNDARY	******

F	BIN		H	OURS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
	F		7-17	18- 6	7 - 17	18 - 6	7 - 17	18 - 6
					MBTU	MBTU	MBTU	\mathtt{MBTU}
-25			0	0	.0000	.0000	.0000	.0000
-20	to	-15	0	0	.0000	.0000	.0000	.0000
-15	to	-10	0	0	.0000	.0000	.0000	.0000
-10	to	-5	0	2	.0000	.2235	.0000	.0000
-5	to	0	0	8	.0000	.8320	.0000	.0000
0	to	5	19	90	1.3950	8.6452	.0000	.0000
5	to	10	28	110	1.8415	9.7580	.0000	.0000
10	to	15	52	153	3.0293	12.4510	.0000	.0000
15	to	20	85	273	4.3113	20.1080	.0000	.0000
20	to	25	160	313	6.9072	20.6380	.0000	.0000
25	to	30	183	415	6.4741	24.0210	.0000	.0000
30	to	35	155	292	4.3046	14.6260	.0000	.0000
35	to	40	213	338	4.2254	14.2480	.0000	.0000
40	to	45	213	415	2.4785	13.3650	.0000	.0000
45	to	50	266	509	1.0356	11.7380	.0000	.0000
50	to	55	274	457	.0000	6.3601	.0000	.0000
55	to	60	271	470	.0000	2.7015	.0000	.0000
60	to	65	302	511	.0000	.0000	.0000	.0000
65	to	70	359	372	.0000	.0000	.0000	.0000
70	to	75	318	202	.0000	.0000	7.2270	.0000
75	to	80	311	101	.0000	.0000	10.0320	.0000
80	to	85	227	50	.0000	.0000	9.9251	.0000
85	to	90	182	27	.0000	.0000	9.5056	.0000
90	to	95	32	2	.0000	.0000	1.8990	.0000
95	to	100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
	ANN		3650	5110	36.0024	159.7155	38.5885	.0000

BUILDING--2359A CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY HEATING AND COOLING	******
******	LOADS REPORT	******
******	BUILDING BOUNDARY	******

MONTH	MECH HEATI 7 - 17	NG LOADS 18 - 6	MECH COOL	NG LOADS
	MBTU	MBTU	MBTU	MBTU
01 JAN	8.7946	28.6970	.0000	.0000
02 FEB	7.9273	25.7670	.0000	.0000
03 MAR	5.1968	21.7790	.0000	.0000
04 APR	1.3148	12.8960	.0000	.0000
05 MAY	.1018	7.5453	2.7697	.0000
06 JUN	.0000	.0000	5.3316	.0000
07 JUL	.0000	.0000	13.0020	.0000
08 AUG	.0000	.0000	10.3850	.0000
09 SEP	.1582	4.8736	7.1003	.0000
10 OCT	.7843	12.0800	.0000	.0000
11 NOV	5.9953	22.7010	.0000	.0000
12 DEC	5.7292	23.3770	.0000	.0000
ANN	36.0024	159.7155	38.5885	.0000

Building Boundary Energy per Square Foot of Total Building area = 67718.6 BTU

BUILDING--2359A CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ZONE # 1 CASE #0

*****	BIN SOLAR ENERGY REPORT	*******
*****	DIRECT GAIN THROUGH	******
*****	WINDOWS AND SKYLIGHTS	******

BIN	HOURS 7-17	SOLAR DIRECT GAIN 7 - 17
F		MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	19	.3003
5 to 10	28	.4435
10 to 15	52	.8254
15 to 20	85	1.3520
20 to 25	160	2.5503
25 to 30	183	2.9230
30 to 35	155	2.4809
35 to 40	213	3.4163
40 to 45	2.13	3.4233
45 to 50	266	4.2840
50 to 55	274	4.4219
55 to 60	271	4.3825
60 to 65	302	4.8938
65 to 70	359	5.8294
70 to 75	318	5.1742
75 to 80	311	5.0706
80 to 85	227	3.7086
85 to 90	182	2.9794
90 to 95	32	.5249
95 to 100	0	.0000
100 to 105	0	.0000
ANN	3650	58.9843

BUILDING--2359A CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ZONE # 1 CASE #0

*****	MONTHLY	INTER	NAL	GAINS	REPORT:	*****
******	LOADS	AND R	WA	SOURCE	ENERGY	******
******		CON	SUM	PTION		******

MONTH	DHW ELEC	LIGHTS ELEC	MISC ELEC	PEOPLE
•	MBTU	MBTU	MBTU	MBTU
01 J	.1703	5.3495	2.4883	.5020
02 F	.1538	4.8318	2.2475	.4534
03 M	.1703	5.3495	2.4883	.5020
04 A	.1648	5.1769	2.4080	.4858
05 M	.1703	5.3495	2.4883	.5020
06 J	.1648	5.1769	2.4080	.4858
07 J	.1703	5.3495	2.4883	.5020
08 A	.1703	5.3495	2.4883	.5020
09 S	.1648	5.1769	2.4080	.4858
10 O	.1703	5.3495	2.4883	.5020
11 N	.1648	5.1769	2.4080	.4858
12 D	.1703	5.3495	2.4883	.5020
TOT	2.0046	62.9856	29.2971	5.9103
RAW SOURCE	6.8131	214.0734	99.5743	5.9103

BUILDING--2359A CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ALL ZONES CASE #0

******	MONTHLY HEATING AND COOLING	*****
******	OUTSIDE AIR LOADS	******
*****	BUILDING BOUNDARY	******

MONTH	HEATING MBTU	COOLING MBTU
01 JAN	15.19343	.00000
02 FEB	13.81052	.00000
03 MAR	11.97079	.00000
04 APR	7.31439	.00000
05 MAY	4.49704	.05877
06 JUN	.00000	.30967
07 JUL	.00000	1.26808
08 AUG	.00000	.69846
09 SEP	2.79113	.50633
10 OCT	5.87678	.00000
11 NOV	12.01328	.00000
12 DEC	12.16541	.00000
ANN	85.63278	2.84131

BUILDING--2359A CASE--BASELINE DATE--4/13/93 PREPARED BY--AJN ALL ZONES CASE #0

*****	MONTHLY HEATING	AND COOLING	******
******	RAW SOURCE	ENERGY	*****
******	CONSUMPTION	REPORT	******

MONTH		AL HEATING NAT GAS MBTU		AL COOLING NAT GAS MBTU
				
01 J		83.4950		.0000
02 F		75.2845		.0000
03 M		61.7228		.0000
04 A		34.1129		.0000
05 M		19.2459		5.4288
06 J		.0000		10.8278
07 J		.0000		27.3905
08 A		.0000		21.2726
09 S		12.3978		14.6001
10 O		29.6998		.0000
11 N		64.5159		.0000
12 D		65.4060		.0000
ANN	· · · · · · · · · · · · · · · · · · ·	445.8806	<u> </u>	79.5198
WIII		443.0000		, , , , , , ,
BTU/SF/YR	HEATING:	128867.2	COOLING:	22982.6

Raw Source Energy per Square Foot of Total Building Area = 151849.8 BTU

5140 511		·		^			B	CE	P .	11	1P	UT	F	Ob	₹N	1		7 T K	VEC	, ,	יום	0 D 4 T	ا ر	
EMC ENG	INE				سر خ	na.	7000									IN CHA						ORAI		
CASE TYPE NEW EXISTING			ting inf 359				(XXX.	IN)			.		•		'	AN CHA	MI FO	וו אנ	א. сін	UN	YABIN	W.XX	,	
PROJECT DE							_					(20 C				- (CASE	or E	CM #			E (mm		
PREPARED BY:		(6C)	BUILD	ING N	AME:					FLOC				#	OF Z	ONES	'	ZONE	NUA	ABER	1.	FAN	,	Y
		4OMT!	ON (OC	2-12)	TARRATT	TH OF	=E 101:		Inn	C000	FAC	TOP	6111	EL TY	oc .		(i)	T C	APACI		01	ART LO		N TS
HEATING	*	ION I P	ON LOC	(i)	MOITI	n U	-r (Or	(1)		CONN	. FAC	· (R)			<i>-</i>	(1)			11 // 01	(R)			2 1	VIN MAX
PART LOAD I POINTS (R)	2	3	4		6	7		9	Ю	ii		FICIEN INTS	(R)		2	3	4	5	6	7	8	9		11
COOLING	M	IONTH	ON (OC	(I)	MON	TH OF	-F (OI	-12) (1)				·	FU	EL TY	PE	(1)	EQP	T. CA	PACI	(R)	# P	ART L	2 N	
PART LOAD POINTS	2	3	4		6	7	8	9	10	11		FICIE!	NCY		2	3	4	5	6	7	8	9	10	11
BIN Nº HEATIN	G BEC	SINS	(1)	BIN	N ₅ CC	юш	NG BE	GINS	•	(1)	•		ON-		HO!	URS ?		co	OL N			HOUR V	s?	
CONDUCT	ON		RUN T	HIS Z	ONE ?						- Ac-					s	OLAR	RAI	DIS	K FIL	E١			
		T	NOR	тн				EAS	т	W	NT.S	SOI	JTH				WE	ST		T		ROOF	F	
AREA	(R)	1		··•		Τ					Γ													
U-VALUE	(R)	+				T	,		· · · · · · · · · · · · · · · · · · ·			•												
COLOR ADJUS	TMEN (R)																			\bot				
CLTD	(1)					\perp					_									_				
EXTERNAL S FACTOR	HADE (R)					\perp				<u>-</u> -	L													
ATTIC		TALITI N	TION ?			Pt			4			ER SL	INSH	IINE	(R)	PERC	ENT	POSS	SIBLE			UNSH		(R)
			N		NE		GI E	ASS	(VE SE	ERTIC E	AL)	s		sw		w		,	NW		SKYL	GLAS		OF
AREA	(F	2)											1											
U-FACTOR	(F	ર																						
SHADING COEFFICIENT	(F	રો											\perp											
COOLING LOA FACTOR	D (F	₹)						\perp			_		\perp				•	_		1				
MAX SHGF, SUMMER	(1)		<u> </u>		┸							1							\bot				
MAX SHGF, WINTER	(1)				\perp		\bot					\perp			<u> </u>		_						
EXTERNAL SE FACTOR	(1	र्ग							,				\perp			<u> </u>	1							
FLOOR O NON TYPE 2 CRAI	e (2) FL(OOR ARE	(R)				(R)	s				w	RATU		(R)						LENG		(R)
TEMP RANGE)			DES S	SIGN	DAY	TEM		TUR	E (i	R) SP D	ACE I	EAT	- 1	١	PERAT		D			1	N		
CONVECTION) NC	Y EL	EVATIO	٧	Al	R FL	OW R		6-00 (R)		'UNC	ACF	M(R) D		G AIR	N		(R) (ING A	UR TEI	MP	(R)
INTERNAL GAINS			THIS Z		} N ₅ (of Th	(PES		DH	w ((1)					S TYP		3)	MIS	C.	(4)	PEO	PLE	(5)
	FUE	L TYP	E				(1)	+			\Box							\perp				\geq	<u>~</u>	\leq
DAY:		H/U		·s			(R)	+			+				-			+						
			AD FAC				(R)	-			\dashv				\vdash			+	•					
	SCH	EDULE	CORRE	ECTIO	N FAC	TOR	(R				士													
NIGHT:	вти	H/U	(IT				(R																	
			OF UNIT				(1)				_[<u> </u>			+						
			OAD FA				(R)	4			4				1			+						
			E CORR	ECTI	ON FA	CTO	R (R				\dashv				+-			+				—		_
INPUT FILE		TICIE		23	:- a	1 -		<u>' </u>				ÇU.	TPU	T FIL	E ((xxxx	(XX.F	L (PT)	2	3 .5	91	RI	_	

	VBCEP INPUT FORM	
EMC ENGINE		COLORADO
BUILDING NUMBER	ER	
SUPPLY AIR (ACFM)	OCCUPIED HOURS: UNOCCUPIED HOURS:	(R)
	OCCUPIED HOURS: UNOCCUPIED HOURS:	
MAX OA/SA RATI	0.7T	(R)
MIN OA/SA RATI		(R)
	HEATING OCCUPIED HOURS HEATING UNOCCUPIED HOUR	
APPROXIMATE RETURN AIR	COOLING OCCUPIED HOURS COOLING UNOCCUPIED HOU	RS (R)
TEMP, *F	(R)	(R)
	DESIRED MIXED AIR TEMPERATURE, °F	
	O.O. IF FIXED OA OR ZONE CONTROLLED (R) ECONOMIZER TYPES	
	ECONOMIZER TYPES	
		٦
	HTG CLG	
	TYPE 1 - "DUMB" TYPE 2-"SMART")
	·	
		•
		•
	•	
		·
ELEVATION IN	FEET (R)	
	1 = MONTHLY MIXED AIR REPORT BY BIN INCREMENT	
REPORT :	2 = ANNUAL REPORT BY MONTH C3-30	

BUILDING--2359A CASE--ECONOMIZER CYCLE DATE--6/23/93 PREPARED BY--AJN ZONE # 1 CASE #1

******	BIN HEATING	AND COOLING	******
******	LOADS	REPORT	******
******	BUILDING	BOUNDARY	******

1	BIN		HO	URS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
	F		7-17	18- 6	7 - 17	18 - 6	7 - 17	18 - 6
					MBTU	MBTU	MBTU	MBTU
-25	to	-20	0	0	.0000	.0000	.0000	.0000
-20	to	-15	0	0	.0000	.0000	.0000	.0000
-15	to	-10	0	0	.0000	.0000	.0000	.0000
-10	to	-5	0	2	.0000	.2235	.0000	.0000
-5	to	0	0	8	.0000	.8320	.0000	.0000
0	to	5	19	90	1.3950	8.6452	.0000	.0000
5	to	10	28	110	1.8415	9.7580	.0000	.0000
10	to	15	52	153	3.0293	12.4510	.0000	.0000
15	to	20	85	273	4.3113	20.1080	.0000	.0000
20	to	25	160	313	6.9072	20.6380	.0000	.0000
25	to	30	183	415	6.4741	24.0210	.0000	.0000
30	to	35	155	292	4.3046	14.6260	.0000	.0000
35	to	40	213	338	4.2254	14.2480	.0000	.0000
40	to	45	213	415	2.4785	13.3650	.0000	.0000
45	to	50	266	509	1.0356	11.7380	.0000	.0000
50	to	55	274	457	.0000	6.3601	.0000	.0000
55	to	60	271	470	.0000	2.7015	.0000	.0000
60	to	65	302	511	.0000	.0000	.0000	.0000
65	to	70	359	372	.0000	.0000	.0000	.0000
70	to	75	318	202	.0000	.0000	7.2270	.0000
75	to	80	311	101	.0000	.0000	10.0320	.0000
80	to	85	227	50	.0000	.0000	9.9251	.0000
85	to	90	182	27	.0000	.0000	9.5056	.0000
90	to	95	32	2	.0000	.0000	1.8990	.0000
95	to	100	. 0	0	.0000	.0000	.0000	.0000
100	to	105	0	. 0	.0000	.0000	.0000	.0000
	ANN		3650	5110	36.0024	159.7155	38.5885	.0000

BUILDING--2359A CASE--ECONOMIZER CYCLE DATE--6/23/93 PREPARED BY--AJN ZONE # 1 CASE #1

*****	MONTHLY HEATING AND COOLING	******
*****	LOADS REPORT	******
*****	BUILDING BOUNDARY	******

MONTH	MECH HEATI	NG LOADS	MECH COOLING LOADS				
	7 - 17	18 - 6	7 - 17	18 - 6			
	MBTU	MBTU	MBTU	MBTU			
01 JAN	8.7946	28.6970	.0000	.0000			
02 FEB	7.9273	25.7670	.0000	.0000			
03 MAR	5.1968	21.7790	.0000	.0000			
04 APR	1.3148	12.8960	.0000	.0000			
05 MAY	.1018	7.5453	2.7697	.0000			
06 JUN	.0000	.0000	5.3316	.0000			
07 JUL	.0000	.0000	13.0020	.0000			
08 AUG	.0000	.0000	10.3850	.0000			
09 SEP	.1582	4.8736	7.1003	.0000			
10 OCT	.7843	12.0800	.0000	.0000			
11 NOV	5.9953	22.7010	.0000	.0000			
12 DEC	5.7292	23.3770	.0000	.0000			
ANN	36.0024	159.7155	38.5885	.0000			

Building Boundary Energy per Square Foot of Total Building area = 67718.6 BTU

BUILDING--2359A CASE--ECONOMIZER CYCLE DATE--6/23/93 PREPARED BY--AJN ZONE # 1 CASE #1

******	BIN SOLAR ENERGY REPORT	******
*****	DIRECT GAIN THROUGH	*******
******	WINDOWS AND SKYLIGHTS	******

BIN F	HOURS 7-17	SOLAR DIRECT GAIN 7 - 17 MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	19	.3003
5 to 10	28	.4435
10 to 15	52	.8254
15 to 20	85	1.3520
20 to 25	160	2.5503
25 to 30	183	2.9230
30 to 35	· 155	2.4809
35 to 40	213	3.4163
40 to 45	213	3.4233
45 to 50	266	4.2840
50 to 55	274	4.4219
55 to 60	271	4.3825
60 to 65	302	4.8938
65 to 70	359	5.8294
70 to 75	318	5.1742
75 to 80	311	5.0706
80 to 85	227	3.7086
85 to 90	182	2.9794
90 to 95	32	.5249
95 to 100	0	.0000
100 to 105	0	.0000
A NINI	2650	50,0043
ANN	3650	58.9843

BUILDING--2359A CASE--ECONOMIZER CYCLE DATE--6/23/93 PREPARED BY--AJN ZONE # 1 CASE #1

******	MONTHLY	INTERNA	L GAINS	REPORT:	******
*****	LOADS	AND RAW	SOURCE	ENERGY	*****
******		CONSU	MPTION		*****

MONTH	DHW	LIGHTS	MISC	PEOPLE
•	ELEC	ELEC	ELEC	
	MBTU	MBTU	MBTU	MBTU
01 J	.1703	5.3495	2.4883	.5020
02 F	.1538	4.8318	2.2475	.4534
03 M	.1703	5.3495	2.4883	.5020
04 A	.1648	5.1769	2.4080	.4858
05 M	.1703	5.3495	2.4883	.5020
06 J	.1648	5.1769	2.4080	.4858
07 J	.1703	5.3495	2.4883	.5020
08 A	.1703	5.3495	2.4883	.5020
09 S	.1648	5.1769	2.4080	.4858
10 O	.1703	5.3495	2.4883	.5020
11 N	.1648	5.1769	2.4080	.4858
12 D	.1703	5.3495	2.4883	.5020
TOT	2.0046	62.9856	29.2971	5.9103
RAW SOURCE	6.8131	214.0734	99.5743	5.9103

BUILDING--2359A CASE--ECONOMIZER CYCLE DATE--6/23/93 PREPARED BY--AJN ALL ZONES CASE #1

******	MONTHLY HEATING AND COOLING	*****
*****	OUTSIDE AIR LOADS	******
*****	BUILDING BOUNDARY	******

MONTH	HEATING	COOLING
	MBTU	MBTU
01 JAN	6.07737	.00000
02 FEB	5.52421	.00000
03 MAR	4.78832	.00000
04 APR	2.92576	.00000
05 MAY	1.79882	.02351
06 JUN	.00000	.12387
07 JUL	.00000	.50723
08 AUG	.00000	.27938
09 SEP	1.11645	.20253
10 OCT	2.35071	.00000
11 NOV	4.80531	.00000
12 DEC	4.86616	.00000
ANN	34.25311	1.13652

BUILDING--2359A CASE--ECONOMIZER CYCLE DATE--6/23/93 PREPARED BY--AJN ALL ZONES CASE #1

******	MONTHLY HEATING	AND COOLING	******
******	RAW SOURCE	ENERGY	******
******	CONSUMPTION	REPORT	******

MONTH	TOT	'AL HEATING NAT GAS MBTU	TOTAL COOLII NAT GAS MBTU		
	· . ——	60.0400			
01 J		69.0480		.0000	
02 F		62.1524		.0000	
03 M		50.3401		.0000	
04 A		27.1579		.0000	
05 M		14.9698		5.3612	
06 J		.0000		10.4711	
07 J		.0000		25.9302	
08 A		.0000		20.4682	
09 S		9.7438		14.0169	
10 O		24.1118		.0000	
11 N		53.0928		.0000	
12 D		53.8383		.0000	
ANN		364.4548		76.2477	
BTU/SF/YR	HEATING:	105333.8	COOLING:	22036.9	

TAB C-4 FORT CARSON RADIATOR CONTROLS ECO #19

COATION: FORT CARSON, COLORADO REGION: 4 PROJECT NO: PROJECT NO: PROJECT NO: CARSON EAP UPDATE FISCAL YEAR: 1992								
DISCRETE PORTION NAME 100 / 101 - 100 / 101 - 101 101 / 101 101 / 101 101 / 101 101 / 101 101 / 101 101 / 101 101 / 101 / 101 101 / 101 / 101 101 / 101		LOCATION: FORT	CARSON, COLO	RADO	REGION:	4	PROJECT NO:	
INVESTMENT COSTS		PROJECT TITLE:	FT CARSON EEA	PUPDATE			FISCAL YEAR:	1992
INVESTMENT COSTS		DISCRETE PORTION	NAME: E	CO #19 - RADIA	TOR CONTROLS		BUILDING NO .:	S-6220
A. CONSTRUCTION COST (5.5% of 1A) = \$371 B. SICH COST (6.5% of 1A) = \$405 D. TOTAL COST (1A + 1B + 1C) = \$77,528 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 TOTAL INVESTMENT (1D - 1E - 1F) = \$7,528 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$7,528 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$7,528 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 95-3273-X USED FOR DISCOUNT FACTORS: COTOBER 1992 ENERGY COST SAVINGS ANNUALS DISCOUNT DISCOUNTED SOURCE \$MBTU (+) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) B. DIST \$7,32 \$0 \$0 11.70 \$0 B. DIST \$7,32 \$0 \$11.70 \$0 B. DIST \$7,32 \$0 \$11.70 \$0 B. DIST \$7,32 \$11.70 \$0 C. NAT GAS \$3.48 \$12.25 \$1,433 \$14.16 \$20,291 D. COAL \$0 \$11.57 \$0 E. SOLAR \$0 \$11.57 \$0 E. SOLAR \$0 \$11.57 \$0 E. SOLAR \$0 \$11.57 \$0 G. TOTAL \$0 \$11.12 \$0 G. TOTAL \$0 \$11.12 \$0 G. TOTAL \$0 \$11.12 \$0 G. TOTAL \$0 \$11.12 \$0 S20,291 B. NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 COST (-) A. ANNUAL RECURRING \$0 COST (-) COST (ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
A. CONSTRUCTION COST (5.5% of 1A) = \$371 B. SICH COST (6.5% of 1A) = \$405 D. TOTAL COST (1A + 1B + 1C) = \$77,528 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 TOTAL INVESTMENT (1D - 1E - 1F) = \$7,528 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$7,528 E. SALVAGE VALUE = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$7,528 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 95-3273-X USED FOR DISCOUNT FACTORS: COTOBER 1992 ENERGY COST SAVINGS ANNUALS DISCOUNT DISCOUNTED SOURCE \$MBTU (+) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) B. DIST \$7,32 \$0 \$0 11.70 \$0 B. DIST \$7,32 \$0 \$11.70 \$0 B. DIST \$7,32 \$0 \$11.70 \$0 B. DIST \$7,32 \$11.70 \$0 C. NAT GAS \$3.48 \$12.25 \$1,433 \$14.16 \$20,291 D. COAL \$0 \$11.57 \$0 E. SOLAR \$0 \$11.57 \$0 E. SOLAR \$0 \$11.57 \$0 E. SOLAR \$0 \$11.57 \$0 G. TOTAL \$0 \$11.12 \$0 G. TOTAL \$0 \$11.12 \$0 G. TOTAL \$0 \$11.12 \$0 G. TOTAL \$0 \$11.12 \$0 S20,291 B. NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 COST (-) A. ANNUAL RECURRING \$0 COST (-) COST (
B. SIOH COST (B.5% of 1A) = \$371 C. DESIGN COST (B.6% of 1A) = \$4,05 D. TOTAL COST (IA + 18 + 1C) = \$57,526 E. SALVAGE VALUE F. SALVAGE VALUE OF EXISTING EQUIP. G. TOTAL INVESTMENT (ID - 1E - 1F) = \$50 S7,526 E. SALVAGE VALUE OF EXISTING EQUIP. F. SALVAGE VALUE OF EXISTING EQUIP. G. TOTAL INVESTMENT (ID - 1E - 1F) = \$50 S7,526 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS (B) FACTOR (B) SAVINGS (B) FACTOR (B) SAVINGS (B) SOURCE \$M85TU (1) M8TUYR (2) SAVINGS (B) FACTOR (B) SAVINGS (B) A. ELEC \$7,32 \$0 11,70 \$0 B. DIST \$50 13,78 \$50 C. NAT GAS \$3.48 412.25 \$1,433 14,16 \$20,291 D. COAL \$50 11,57 \$50 E. SOLAR \$50 11,57 \$50 F. DEMAND SAVINGS \$59,58 / year \$50 11,12 \$50 G. TOTAL 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING 1 10 ISCOUNT FOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (C) COST (C) B. NONRECURRING 1 10 ISCOUNT FACTOR (B) SAVINGS (C) COST (C) COST (C) COST (C) COUNT FACTOR (B) SAVINGS (C) COST	1 IN	VESTMENT COSTS						
B. SIOH COST (B.5% of 1A) = \$371 C. DESIGN COST (B.6% of 1A) = \$4,05 D. TOTAL COST (IA + 18 + 1C) = \$57,526 E. SALVAGE VALUE F. SALVAGE VALUE OF EXISTING EQUIP. G. TOTAL INVESTMENT (ID - 1E - 1F) = \$50 S7,526 E. SALVAGE VALUE OF EXISTING EQUIP. F. SALVAGE VALUE OF EXISTING EQUIP. G. TOTAL INVESTMENT (ID - 1E - 1F) = \$50 S7,526 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS (B) FACTOR (B) SAVINGS (B) FACTOR (B) SAVINGS (B) SOURCE \$M85TU (1) M8TUYR (2) SAVINGS (B) FACTOR (B) SAVINGS (B) A. ELEC \$7,32 \$0 11,70 \$0 B. DIST \$50 13,78 \$50 C. NAT GAS \$3.48 412.25 \$1,433 14,16 \$20,291 D. COAL \$50 11,57 \$50 E. SOLAR \$50 11,57 \$50 F. DEMAND SAVINGS \$59,58 / year \$50 11,12 \$50 G. TOTAL 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING 1 10 ISCOUNT FOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (B) COUNT FACTOR (B) SAVINGS (C) COST (C) B. NONRECURRING 1 10 ISCOUNT FACTOR (B) SAVINGS (C) COST (C) COST (C) COST (C) COUNT FACTOR (B) SAVINGS (C) COST	A.	CONSTRUCTION COST		=			\$6,750	
C. DESIGN COST (8.0% of 1A) = \$405 D. TOTAL COST (1A + 18 + 10) = \$57,528 E. SALVAGE VALUE				(5.5% of 1A) =			• •	
E. SALVAGE VALUE	C.	DESIGN COST		(6.0% of 1A) =			\$405	
F. SALVAGE VALUE OF EXISTING EQUIP. G. TOTAL INVESTMENT (1D - 1E - 1F) = \$\$\$ \$7,526 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY SAVINGS (-) or COST SAVINGS ANNUAL \$ DISCOUNT DISCOUNTED SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-) SAVINGS (-) FACTOR (-)	D.	TOTAL COST		(1A + 1B + 1C) =			\$7,526	
G. TOTAL INVESTMENT (1D - 1E - 1F) =	E.	SALVAGE VALUE		=			\$0	
2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL\$ DISCOUNT DISCOUNTED SOURCE \$4MBTU (1) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5) A. ELEC \$7.32 \$0 11.70 \$0 B. DIST \$0 13.78 \$0 C. NAT GAS \$3.48 412.25 \$1,433 14.16 \$20,291 D. COAL \$0 11.57 \$0 E. SOLAR \$0 11.57 \$0 E. SOLAR \$0 11.12 \$0 G. TOTAL \$412.25 \$1,433 \$1.41.12 \$0 T. DEMAND SAVINGS \$69.68 / year \$0 11.12 \$0 G. TOTAL \$412.25 \$1,433.0 \$11.12 \$0 B. NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$69.68 / year \$67 \$1.433.0 \$0 B. NONECURRING \$50 \$0 \$0 B. NONRECURRING \$50 \$0 \$0 COST (1) OCCURRENCE (2) FACTOR (3) \$VGs or COST (4) a. \$50 \$0 \$0 \$0.00 \$50 b. \$50 \$0 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0 \$0.00 \$50 c. \$50 \$0.00 \$50 c. \$50 \$0.00 \$50 c. \$50 \$0.00 \$50 c. \$50 \$0.00 \$50 c. \$50 \$0.0	F.	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY	G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$7,526
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY								
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY	2 EN	NERGY SAVINGS (+) or	COST (-)					
SOURCE \$MBTU (1) MBTU/R (2) SAVINGS (3) FACTOR (4) SAVINGS (5)				NT FACTORS: C	CTOBER 1992			
A. ELEC \$7.32 \$0 11.70 \$0 B. DIST \$0 13.78 \$0 C. NAT GAS \$3.48 412.25 \$1,433 14.16 \$20,291 D. COAL \$0 11.57 \$0 E. SOLAR \$0 11.57 \$0 F. DEMAND SAVINGS \$69.68 / year \$0 11.12 \$0 G. TOTAL \$0 11.12 \$0 SO 11.12 \$0 G. TOTAL \$69.68 / year \$0 11.12 \$0 G. TOTAL \$69.68 / year \$0 11.12 \$0 F. DEMAND SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 \$0 1 DISCOUNT FACTOR \$0 \$0 2 DISCOUNTED SAVINGS or COST \$0 \$0 B. NONRECURRING ITEM \$AVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0 0.00 \$0 c. \$0 0 0 0.00 \$0 c. \$0 0 0 0.00 \$0 c. \$0 0 0 0.00 \$0 c. \$0 0 0 0.00 \$0 d TOTAL \$0 \$0 0 0.00 \$0 c. TOTAL NONENERGY DISCOUNTED SAVINGS or COST \$0 4 SIMPLE PAYBACK (SPB) - (YRS) \$1 G/(2G3 + 3A + (3Bd1/15)) = \$5.3 5 TOTAL NET DISCOUNTED SAVINGS \$1 (3A2 + 3Bd4) = \$0.27 \$20.291		ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
B. DIST C. NAT GAS \$3.48 412.25 \$1,433 14.16 \$20,291 D. COAL E. SOLAR SO T1.57 \$0 E. SOLAR SO TOTAL \$0		SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
C. NAT GAS \$3.48 412.25 \$1,433 14.16 \$20,291 D. COAL \$0 11.57 \$0 E. SOLAR \$0 11.57 \$0 F. DEMAND SAVINGS \$69.68 / year \$0 11.12 \$0 G. TOTAL 412.25 1,433.0 \$11.12 \$0 SOLAR \$0 11.12 AR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 SOLAR \$0 10 SOLAR \$0 S	A.	ELEC	\$7.32		\$0	11.70	\$0	
D. COAL E. SOLAR SO T11.57 SO E. SOLAR SO T. DEMAND SAVINGS \$69.68 / year \$0 TOTAL \$11.12 \$0 TOTAL \$12.25 \$1,433.0 \$11.12 \$0 TOTAL \$11.12 \$0 TOTAL \$12.25 \$1,433.0 \$11.12	В.	DIST			\$0	13.78	\$0	
E. SOLAR F. DEMAND SAVINGS \$69.68 / year \$0 11.12 \$0 G. TOTAL \$12.25 1,433.0 \$11.12 \$0 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 11.12 \$0 1 DISCOUNT FACTOR \$(From Table A-2) = 11.12 \$0 2 DISCOUNTED SAVINGS or COST \$(3A x 3A1) = \$0 B. NONRECURRING \$1TEM \$SAVINGS or COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0 0.00 \$0 b. \$0 0 0 0.00 \$0 c. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$0 0 0.00 \$0 d TOTAL \$0 \$0 0 0.00 \$0 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST \$(3A2 + 3Bd4) = \$0 4 SIMPLE PAYBACK (SPB) - (YRS) \$1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS (SIR) \$1 (SIR	C.	NAT GAS	\$3.48	412.25	\$1,433	14.16	\$20,291	
F. DEMAND SAVINGS \$69.68 / year \$0 11.12 \$0 G. TOTAL 412.25 1,433.0 \$20,291 3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING \$0 (From Table A-2) = 11.12 \$0 1 DISCOUNT FACTOR (From Table A-2) = 11.12 \$0 B. NONRECURRING TEM SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING TEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$0 4 SIMPLE PAYBACK (SPB) - (YRS) \$1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR)	D.	COAL			\$0	11.57	\$0	
G. TOTAL 412.25 1,433.0	E.	SOLAR			\$0		\$0	
3 NONENERGY SAVINGS (+) or COST (-) A. ANNUAL RECURRING 1 DISCOUNT FACTOR 2 DISCOUNTED SAVINGS or COST 3 (3A x 3A1) = 11.12 2 DISCOUNTED SAVINGS or COST 3 (3A x 3A1) = 50 B. NONRECURRING 1 ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS 5 TOTAL NET DISCOUNTED SAVINGS 6 SAVINGS-TO-INVESTMENT RATIO (SIR) 2.70	F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	
A. ANNUAL RECURRING 1 DISCOUNT FACTOR (From Table A-2) = 11.12 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST 4 SIMPLE PAYBACK (SPB) - (YRS) 1 G/(2G3 + 3A + (3Bd1/15)) = \$5.3 5 TOTAL NET DISCOUNTED SAVINGS 6 SAVINGS-TO-INVESTMENT RATIO (SIR)	G.	TOTAL	•	412.25	1,433.0		>	\$20,291
A. ANNUAL RECURRING 1 DISCOUNT FACTOR (From Table A-2) = 11.12 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST 4 SIMPLE PAYBACK (SPB) - (YRS) 1 G/(2G3 + 3A + (3Bd1/15)) = \$5.3 5 TOTAL NET DISCOUNTED SAVINGS 6 SAVINGS-TO-INVESTMENT RATIO (SIR)								
1 DISCOUNT FACTOR (From Table A-2) = 11.12 2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0 B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 c. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$0 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS (SIR) \$0 6 SAVINGS-TO-INVESTMENT RATIO (SIR)	3 NO	ONENERGY SAVINGS (+) or COST (-)					
2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0	A.	ANNUAL RECURRING					\$0	
B. NONRECURRING ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$0 0 0.00 \$0 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3B44) = \$0 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) = \$5.3 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR)		1 DISCOUNT FACTOR			(From Table A-2) =	11.12		
TEM		2 DISCOUNTED SAVING	S or COST		(3A x 3A1) =		\$0	
TEM		NONDECLIDRING						
COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4) a. \$0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL \$0 0 0.00 \$0 C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST \$0 4 SIMPLE PAYBACK (SPB) - (YRS) \$1G/(2G3 + 3A + (3Bd1/15)) = \$5.3 5 TOTAL NET DISCOUNTED SAVINGS \$(2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR)	ъ.			SAVINGS of	VEAD OF	DISCOLINE	DISCOLINITED	
a. \$0 0 0.00 \$0 b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST \$0 4 SIMPLE PAYBACK (SPB) - (YRS) \$1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR)								
b. \$0 0 0.00 \$0 c. \$0 0 0.00 \$0 d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$0 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.70		a		` `	• • •	• •	• •	
c.					_		•	
d TOTAL C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST 4 SIMPLE PAYBACK (SPB) - (YRS) 5 TOTAL NET DISCOUNTED SAVINGS 6 SAVINGS-TO-INVESTMENT RATIO (SIR) 5 (3A2 + 3Bd4) = \$0 (3A2 +								
C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) = \$0 4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) = 5.3 5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.70					•	0.00	•	
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.70	C.	TOTAL NONENERGY DIS	SCOUNTED SAVING	SS or COST		(3A2 + 3Bd4) =		
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$20,291 6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.70						, ,		,
6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.70	4 SI	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A + (3Bd1/15)) =		5.3
6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 2.70	5 TC	OTAL NET DISCOUNTE	D SAVINGS			(2G5 + 3C) =		\$20,291
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%) [(1+.04) x SIR to 1/15 power - 1] x 100 = 11.11	6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)					
	7 AC	DJUSTED INTERNAL RA	ATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		11.11

							•
	LOCATION: F	FORT CARSON, CO	LORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE	: FT CARSON EE	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE POR	TION NAME:	ECO #19 - RADIA	ATOR CONTROLS		BUILDING NO.:	S-6221
	ANALYSIS DATE	E: 07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
1 160	VESTMENT COST	rs					
	CONSTRUCTION		=			\$4,024	l
	SIOH COST		= (5.5% of 1A) =			\$221	
	DESIGN COST		(6.0% of 1A) =			\$241	
	TOTAL COST		(1A + 1B + 1C) =			\$4,487	
	SALVAGE VALUE		. ,			\$0	1
F.	SALVAGE VALUE	OF EXISTING EQUIP.	=	*		\$0	1
G.	TOTAL INVESTME	INT	(1D - 1E - 1F) =			>	\$4,487
2 EN	IERGY SAVINGS	(+) or COST (-)					
		73-X USED FOR DISCO	UNT FACTORS: C	OCTOBER 1992			
,	ENERGY	COST	SAVINGS		DISCOUNT	DISCOUNTED)
	SOURCE	\$/MBTU (1)	MBTU/YR (2)		FACTOR (4)		
A.	ELEC	\$7.32		\$0	11.70	\$0	1
В.	DIST			\$0	13.78	\$0	1
C.	NAT GAS	\$3.48	193.37	\$672	14.16	\$9,518	l .
D.	COAL			\$0	11.57	\$0)
E.	SOLAR			\$0		\$0	1
F.	DEMAND SAVING	s \$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		193.37	\$672		>	\$9,518
		NGS (+) or COST (-)					
A.	ANNUAL RECURR					\$0	1
	1 DISCOUNT FAC			(From Table A-2) =	11.12		
	2 DISCOUNTED S	SAVINGS or COST		(3A x 3A1) =		\$0	1
В.	NONRECURRING						
	ITEM	•	SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED)
				OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	•
	b.		\$0		0.00	•	
	c.		\$0		0.00		
_	d TOTAL		\$0			\$C	
C.	TOTAL NONENER	GY DISCOUNTED SAVI	NGS or COST		(3A2 + 3Bd4) =		\$0
4 SII	MPLE PAYBACK (SPB) - (YRS)		1G/6	2G3 + 3A + (3Bd1/15)) =		6.7
	TAL NET DISCOL				(2G5 + 3C) =		\$9,518
		STMENT RATIO (SIR)	í		(5/1G) =		2.12
		, ,		[(1 , 04) × CID +-	, ,		9.35
/ AU	MADIED INTERN	AL RATE OF RETUR	14 (MITT) - (76)	[(1+.04) X SIH to	1/15 power - 1] x 100 =		9.35

	LOCATION: FORT	CARSON, COLO	RADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEAI	PUPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: EC	O #19 - RADIA	TOR CONTROLS	}	BUILDING NO.:	S-6222
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	: 15	PREPARED BY:	A. NIEMEYER
1 160	/ESTMENT COSTS						
	CONSTRUCTION COST		_			\$12,72 ⁻	1
A. B.	SIOH COST		= (5.5% of 1A) =			\$700	
	DESIGN COST		(6.0% of 1A) =			\$76:	
D.	TOTAL COST		(1A + 1B + 1C) =			\$14,184	
E.	SALVAGE VALUE		=			\$(
F.	SALVAGE VALUE OF EX	CISTING EQUIP.	_			\$(
	TOTAL INVESTMENT		(1D - 1E - 1F) =			***********	
			(••••
0 EN	IEDOV SAVINOS (.)	COST()					
	IERGY SAVINGS (+) or TE OF NISTIR 85-3273-X I		T EACTORS O	CTORED 1002			
DA	ENERGY	COST	VI FACTORS: 0 SAVİNGS	ANNUAL \$	DISCOL	INT DISCOUNTE	,
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)			
۸	ELEC	\$7.32	WID10/11 (2)	\$0		.70 SAVINGS (5	•
О. В.	DIST	φ1.52		\$0		.78 \$	
	NAT GAS	\$3.48	641.17	\$2,229		.16 \$31,55	
D.	COAL	40.40	041.11	\$0		.57 \$	
	SOLAR			\$0		.o., \$	
F.	DEMAND SAVINGS	\$69.68 / year		\$0		.12 \$	
	TOTAL	ф00.00 / year	641.17	\$2,229		···	****
			· · · · · ·	72,220			40.,000
3 NC	NENERGY SAVINGS	(4) or COST (4)					
	ANNUAL RECURRING	(+) 01 0031 (-)				\$	n
۸.	1 DISCOUNT FACTOR			(From Table A-2) =	. 11	.12	J
	2 DISCOUNTED SAVING	GS or COST		$(3A \times 3A1) =$.12 \$	n
	2 DISCOUNTED SAVING	G3 01 CO31		(SA X SA I) =		Ψ	J
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOL	INT DISCOUNTE	D
			• •	OCCURRENCE (2)		(3) SVGS or COST (4	•
	a.		\$0	0		.00 \$	
	b.		\$0	0		.00 \$	
	c.		\$0	0	0	.00 \$	
	d TOTAL		\$0			\$	
C.	TOTAL NONENERGY D	ISCOUNTED SAVING	S or COST		(3A2 + 3Bd	4) =	\$0
4 611	MDIE DAVEACY (CDD)	(VDC)		بنجد	(OOD - OA - (OD 44 15 T		0.4
	MPLE PAYBACK (SPB)	• •		1G/	(2G3 + 3A + (3Bd1/15)	•	6.4
	TAL NET DISCOUNTE				(2G5 + 30		\$31,558
	VINGS-TO-INVESTME	` '			(5/10	ā) =	2.22
7 AC	JUSTED INTERNAL R	ATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100	=	9.70

	LOCATION: FO	ORT CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORT	ION NAME: E	CO #19 - RADIA	ATOR CONTROLS		BUILDING NO.:	S-6223
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS	.					
	CONSTRUCTION CO		=			\$9,476	;
	SIOH COST		(5.5% of 1A) =			\$521	
C.	DESIGN COST		(6.0% of 1A) =			\$569	1
D.	TOTAL COST		(1A + 1B + 1C) =			\$10,566	i
E.	SALVAGE VALUE		=			\$0	1
F.	SALVAGE VALUE OF	F EXISTING EQUIP.	=			\$C	1
G.	TOTAL INVESTMENT	т	(1D - 1E - 1F) =			>	\$10,566
2 EN	NERGY SAVINGS (+	-) or COST (-)					
	·-	3-X USED FOR DISCOU	UNT FACTORS: C	OCTOBER 1992			
	ENERGY	cost	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	11.70	\$0	•
₿.	DIST			\$0	13.78	\$C	
	NAT GAS	\$3.48	319.30	* . •	14.16		
	COAL			\$0	11.57	•	
	SOLAR			\$0		\$0	
	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		319.30	\$1,110		>	\$15,716
0.11		36 (1) == 000T (1					
	ONENERGY SAVING					*-	
A.	ANNUAL RECURRIN					\$0	
	1 DISCOUNT FACTO			(From Table A-2) =	11.12		
	2 DISCOUNTED SA	VINGS OF COST		(3A x 3A1) =		\$0	
8.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			• • •	OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$0		0.00		
	b.		\$0		0.00	•	
	C.		\$0		0.00	· ·	
_	d TOTAL	·/ D. 10.00 ()	\$0			\$0	
C.	TOTAL NONENERGY	Y DISCOUNTED SAVIN	GS or COST		(3A2 + 3Bd4) =		\$0
4 SII	MPLE PAYBACK (SI	PB) - (YRS)		1G/0	2G3 + 3A + (3Bd1/15)) =		9.5
	OTAL NET DISCOUN			. 47(6			
					(2G5 + 3C) =		\$15,716
	VINGS-TO-INVEST			_	(5/1 G) =		1.49
7 AC	JUSTED INTERNAL	L RATE OF RETURN	I (AIRR) - (%)	((1+.04) x SIR to	1/15 power - 1] x 100 =		6.79

	LOCATION: FORT	CARSON COL	ODADO	DECION:	4	DDO IFOT NO.	
		CARSON, COL		REGION:	4	PROJECT NO:	
		FT CARSON EE				FISCAL YEAR:	
	DISCRETE PORTION	NAME: E	ECO #19 - RADIA	TOR CONTROLS		BUILDING NO.:	S-6224
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	: 15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST		=			\$22,457	
В.	SIOH COST		(5.5% of 1A) =			\$1,235	
C.	DESIGN COST		(6.0% of 1A) =			\$1,347	
D.	TOTAL COST		(1A + 1B + 1C) =			\$25,039	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EX	(ISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			 >	\$25,039
2 EN	NERGY SAVINGS (+) or	COST (-)					
DA	TE OF NISTIR 85-3273-X I	USED FOR DISCOL	JNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	11.70	\$0	
В.	DIST			\$0	13.78	\$0	
C.	NAT GAS	\$ 3.48	818.70	\$2,846	14.16	\$40,297	
Đ.	COAL			\$0	11.57	\$0	
Ε.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		818.70	\$2,846		>	\$40,297
3 NC	ONENERGY SAVINGS ((+) or COST (-)					
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	11.12		
	2 DISCOUNTED SAVING	GS or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$0	_	5.55	\$0	
C.	TOTAL NONENERGY DI	SCOUNTED SAVIN			(3A2 + 3Bd4) =	**	\$0
					, ,		70
4 SII	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A + (3Bd1/15)) =		8.8
5 TC	TAL NET DISCOUNTE	D SAVINGS			(2G5 + 3C) =		\$40,297
6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)			(5/1G) =		1.61
7 AC	JUSTED INTERNAL RA	ATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		7.35

						•	
	LOCATION: F	FORT CARSON, COI	LORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE	: FT CARSON EE	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE POR	TION NAME:	ECO #19 - RADIA	ATOR CONTROLS		BUILDING NO.:	S-6236
	ANALYSIS DATE	E: 07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
1 INN	VESTMENT COST	rs					
	CONSTRUCTION		_			\$19,471	
	SIOH COST	,	- (5.5% of 1A) =			\$1,071	
	DESIGN COST		(6.0% of 1A) =			\$1,168	
	TOTAL COST		(1A + 1B + 1C) =			\$21,710	
	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE	OF EXISTING EQUIP.	=			\$0	
G.	TOTAL INVESTME	ENT	(1D - 1E - 1F) =			··>	\$21,710
2 FN	IERGY SAVINGS	(+) or COST (-)					
		(+) Gr COS ((-) 273-X USED FOR DISCO	OUNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)		FACTOR (4)		
A.	ELEC	\$7.32	.,	\$0	11.70	, ,	
В.	DIST			\$0	13.78	\$0	
C.	NAT GAS	\$3.48	666.62	\$2,317	14.16	\$32,811	
D.	COAL			\$0	11.57	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVING	s \$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		666.62	\$2,317		·····>	\$32,811
3 NC	NENERGY SAVI	NGS (+) or COST (-)					
A.	ANNUAL RECURR	IING				\$0	
	1 DISCOUNT FAC	TOR		(From Table A-2) =	11.12		
	2 DISCOUNTED S	SAVINGS or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or		DISCOUNT		
				OCCURRENCE (2)	, ,	SVGS or COST (4)	
	a.		\$0			\$0	
	b.		\$0 \$0		0.00	\$0 \$0	
	c.		\$0		0.00	\$0	
_	d TOTAL	GY DISCOUNTED SAVI	\$0 MGS or COST		(3A2 + 3Bd4) =	\$0	\$0
U.	IO I AL NONENER	GT DISCOUNTED SAVI	14G3 U CO31		(SM2 + 3DU4) =		Φ0
4 SII	MPLE PAYBACK ((SPB) - (YRS)		1G/(2G3 + 3A + (3Bd1/15)) =		9.4
5 TC	TAL NET DISCOL	JNTED SAVINGS			(2G5 + 3C) =		\$32,811
6 SA	VINGS-TO-INVES	STMENT RATIO (SIR)	ı		(5/1G) =		1.51
7 AD	JUSTED INTERN	AL RATE OF RETUR	N (AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		6.90

	LOCATION: FOR	TCARSON, COLC	DRADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO #19 - RADIA	TOR CONTROLS		BUILDING NO.:	S-6237
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST	ī	=			\$19,471	
В.	SIOH COST		(5.5% of 1A) =			\$1,071	
C.	DESIGN COST		(6.0% of 1A) =			\$1,168	
D.	TOTAL COST		(1A + 1B + 1C) =			\$21,710	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF E	XISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$21,710
	NERGY SAVINGS (+) o	• • •					
DA	TE OF NISTIR 85-3273-X						
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
	ELEC	\$7.32		\$0	11.70	\$0	
	DIST	***	745 70	\$0	13.78	\$0	
	NAT GAS	\$3.48	745.73	\$2,592	14.16	\$36,705	
	COAL			\$0	11.57	\$0	
	SOLAR	***		\$0		\$0	
	DEMAND SAVINGS	\$69.68 / year	745 70	\$0	11.12	\$0	
G.	TOTAL		745.73	\$2,592		*********	\$36,705
3 NO	ONENERGY SAVINGS	(+) or COST (-)					
	ANNUAL RECURRING	(,, ,, ,, ,, ,,				\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	11.12	Ψ	
	2 DISCOUNTED SAVIN			(3A x 3A1) =	11.12	\$0	
				(417.411)		4 0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)	• •	SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
_	d TOTAL		\$0			\$0	
C.	TOTAL NONENERGY D	ISCOUNTED SAVING	GS or COST		(3A2 + 3Bd4) =		\$0
4 SI	MPLE PAYBACK (SPB) - (YRS)		1G/6	2G3 + 3A + (3Bd1/15)) =		8.4
	OTAL NET DISCOUNTE	-			(2G5 + 3C) =		\$36,705
	AVINGS-TO-INVESTME				(5/1G) =		1.69
	DJUSTED INTERNAL F	, ,	(AIRR) - (%)	[(1+.04) x SIR to	(3/13) = 1/15 power - 1] x 100 =		7.71
			(· ··· · · · · · · · · · · · · · · · ·	[(11.0-4) × 011.10	., pono: 11×100 =		1.11

							•
	LOCATION: FORT	CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	ECO #19 - RADIA	ATOR CONTROLS		BUILDING NO.:	S-6243
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
	ESTMENT COSTS						
	CONSTRUCTION COST		=			\$13,370	
	SIOH COST		(5.5% of 1A) =			\$735	
	DESIGN COST		(6.0% of 1A) =			\$802	
	TOTAL COST		(1A + 1B + 1C) =			\$14,908	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EXI	ISTING EQUIP.	=			\$0	_
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$14,908
2 EN	ERGY SAVINGS (+) or	COST (-)					
	TE OF NISTIR 85-3273-X U	• •	JNT FACTORS: 0	OCTOBER 1992			
	ENERGY	COST	SAVINGS		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	•	FACTOR (4)		
A.	ELEC	\$7.32	, 	\$0	11.70	• •	
В.	DIST			\$0	13.78	•	
	NAT GAS	\$3.48	850.11	*	14.16	•	
D.	COAL			\$0	11.57		
	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	•	(
G.	TOTAL	• •	850.11	\$2,955		·>	\$41,843
2 NO	MENERCY SAVINGS () or COST ()				•	
	NENERGY SAVINGS (4	r) or COS1 (-)				^ -	
A.	ANNUAL RECURRING			/Comm Table 4 0)	44.40	\$0	
	1 DISCOUNT FACTOR 2 DISCOUNTED SAVING	e COPT		(From Table A-2) =	11.12		
		3 0FCOST		(3A x 3A1) =		\$0	
В.	NONRECURRING			,			
	ITEM		SAVINGS or		DISCOUNT		
				OCCURRENCE (2)	, ,	SVGS or COST (4)	
	a. L		\$0	_		\$0	
	b.		\$0	0	0.00	\$0	
	C.		\$0	0	0.00	\$0	
_	d TOTAL		\$0			\$0	*-
C.	TOTAL NONENERGY DIS	COUNTED SAVIN	GS or COST		(3A2 + 3Bd4) =		\$0
4 SIN	MPLE PAYBACK (SPB) -	· (YRS)		1G/(2	G3 + 3A + (3Bd1/15)) =		5.0
	TAL NET DISCOUNTED				(2G5 + 3C) =		\$41,843
	VINGS-TO-INVESTMEN				(5/1G) =		2.81
	JUSTED INTERNAL RA		I (AIRR) - (%)	[(1÷.04) x SIR to 1	/15 power - 1] x 100 =		11.41
				••	•		

	LOCATION: FORT	CARSON, COL	ORADO	REGION:	4	PROJECT NO:			
				ALGION.	•		1000		
	PROJECT TITLE:	FT CARSON EE					1992		
	DISCRETE PORTION	NAME: E	ECO #19 - RADI <i>A</i>	TOR CONTROLS	i	BUILDING NO.:			
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER		
1 IN	VESTMENT COSTS								
A.	CONSTRUCTION COST	•	=			\$15,317			
В.	SIOH COST		(5.5% of 1A) =			\$842			
C.	DESIGN COST		(6.0% of 1A) =			\$919			
D.	TOTAL COST		(1A + 1B + 1C) =			\$17,079			
E.	SALVAGE VALUE		=			\$0			
F.	SALVAGE VALUE OF E	XISTING EQUIP.	=			\$0			
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$17,079		
2 EN	IERGY SAVINGS (+) o	r COST (-)							
DA	TE OF NISTIR 85-3273-X	USED FOR DISCOL	UNT FACTORS: C	CTOBER 1992					
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED			
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)			
A.	ELEC	\$7.32		\$0	11.70	\$0			
В.	DIST			\$0	13.78	\$0			
C.	NAT GAS	\$3.48	591.45	\$2,056	14.16	\$29,111			
D.	COAL			\$0	11.57	\$0			
E.	SOLAR			\$0		\$0			
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0			
G.	TOTAL		591.45	2,055.9		>	\$29,111		
3 NC	NENERGY SAVINGS	(+) or COST (-)							
	ANNUAL RECURRING					\$0			
	1 DISCOUNT FACTOR			(From Table A-2) =	11.12	•			
	2 DISCOUNTED SAVIN	GS or COST		(3A x 3A1) =		\$0			
_				, ,		•			
В.	NONRECURRING		***						
	ITEM		SAVINGS or		DISCOUNT				
				OCCURRENCE (2)		SVGS or COST (4)			
	a. L		\$0	0	0.00	\$0			
	b .		\$0	0	0.00	\$0			
	C.		\$0	0	0.00	\$0			
_	d TOTAL	ICCOUNTED CAVIN	\$0 TOO OO!		(240	\$0			
U.	TOTAL NONENERGY D	ISCOUNTED SAVIN	IGS of COST		(3A2 + 3Bd4) =		\$0		
4 SI	MPLE PAYBACK (SPB)) - (YRS)		16//	2G3 + 3A + (3Bd1/15)) =		8.3		
				197(•				
	\$ TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$29,111 \$ SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) = 1.70								
		• •			(5/1G) =		1.70		
/ AL	JUSTED INTERNAL P	MIL OF RETURN	i (AIHH) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		7.76		

									!
L	OCATION:	FORT C	ARSON, COL	ORADO	REGION:	4		PROJECT NO:	
F	PROJECT TITLE	E: FT	CARSON EE	AP UPDATE				FISCAL YEAR:	1992
	DISCRETE POF	RTION N	AME:	ECO #19 - RADIA	ATOR CONTROLS			BUILDING NO.:	S-6231
A	NALYSIS DAT	E:	07/01/93		ECONOMIC LIFE	:15		PREPARED BY:	A. NIEMEYER
1 INVE	STMENT COS	TS							
	CONSTRUCTION			=				\$13,370	
B. S	SIOH COST			(5.5% of 1A) =				\$735	
C. D	ESIGN COST			(6.0% of 1A) =				\$802	
D. T	TOTAL COST			(1A + 1B + 1C) =				\$14,908	
E. 9	SALVAGE VALUE	•		=				\$0	
F. S	SALVAGE VALUE	OF EXIS	TING EQUIP.	=				\$0	
G. T	OTAL INVESTME	ENT		(1D - 1E - 1F) =				*******>	\$14,908
2 ENE	RGY SAVINGS	(+) or C	OST (-)						·
DATE	OF NISTIR 85-3	273-X US		UNT FACTORS: C	OCTOBER 1992				
	ENERGY		COST	SAVINGS			SCOUNT	DISCOUNTED	
	SOURCE		\$/MBTU (1)	MBTU/YR (2)		FA	CTOR (4)	SAVINGS (5)	
A. E			\$7.32		\$0		11.70	\$0	
B. D			An		\$0		13.78	\$0 \$07.045	
	LAT GAS		\$3.48	553.54			14.16		•
D. C					\$0		11.57	\$0 \$0	
	SOLAR SEMANO SAVING		teo eo /		\$0 \$0		44 40	\$0 \$0	
	DEMAND SAVING TOTAL	10 (\$69.68 / year	553.54	\$0 \$1,924		11.12	\$0	\$27,245
J. 1	- (Fig.			555.54	ψ1,32 4				φ21,270
3 NON	ENERGY SAVI	NGS (4)	or COST (-)						
	NNUAL RECURF		J. 0001 (-)					\$0	
	DISCOUNT FAC				(From Table A-2) =		11.12	ΨΟ	
	DISCOUNTED		or COST		(3A x 3A1) =		2	\$0	
			•		,,			*-	
	IONRECURRING	i		6414166	\#.=.==		000: ·· :-	DI200: " ====	
	ITEM			SAVINGS or	. —		SCOUNT	DISCOUNTED	
•	•			\$0	OCCURRENCE (2)	FA	0.00	SVGS or COST (4)	
a. b				\$0 \$0	0		0.00	\$0 \$0	
c				\$0 \$0	0		0.00	\$0 \$0	
	TOTAL			\$0	· ·		5.00	\$0	
	OTAL NONENER	RGY DISC	OUNTED SAVI			(3A2 -	+ 3Bd4) =	**	\$0
						•	•		
4 SIMP	PLE PAYBACK	(SPB) - (YRS)		1G/(2G3 + 3A + (3B	d1/15)) =		7.7
5 TOTA	AL NET DISCO	UNTED :	SAVINGS			(2G	5 + 3C) =		\$27,245
6 SAVI	NGS-TO-INVES	STMENT	RATIO (SIR)				(5/1G) =		1.83
7 ADJL	JSTED INTERN	NAL RAT	E OF RETURI	N (AIRR) - (%)	[(1+.04) x SIR to	I/15 power - 1]	x 100 =		8.27

	LOCATION: FOR	T CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	AP UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTIO	N NAME: E	ECO #19 - RADIA	TOR CONTROLS		BUILDING NO.:	S-6235
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE		PREPARED BY:	A NIEMEYER
	ANALIOIO DATE.	07,01,00		EGONOMIO EN E	. 10		, a raiciale ren
	VESTMENT COSTS						
	CONSTRUCTION COS	τ .	=			\$13,370	
	SIOH COST		(5.5% of 1A) =			\$735	
	DESIGN COST		(6.0% of 1A) =			\$802	
	TOTAL COST		(1A + 1B + 1C) =			\$14,908	
	SALVAGE VALUE		=			\$0	
F.		EXISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			******>	\$14,908
2 EN	IERGY SAVINGS (+)	or COST (-)					
DA	TE OF NISTIR 85-3273-X	USED FOR DISCOU	JNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	11.70	\$0	1
В.	DIST			\$0	13.78	\$0	1
C.	NAT GAS	\$ 3.48	553.54	\$1,924	14.16	\$27,245	i
D.	COAL			\$0	11.57	\$0	1
E.	SOLAR			\$0		\$0	•
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	1
G.	TOTAL		553.54	\$1,924		>	\$27,245
3 NC	NENERGY SAVINGS	6 (+) or COST (-)					
A.	ANNUAL RECURRING					\$0	1
	1 DISCOUNT FACTOR	1		(From Table A-2) =	11.12		
	2 DISCOUNTED SAVII	NGS or COST		(3A x 3A1) =		\$0	1
_	NONDECLIDENC						
٥.	NONRECURRING ITEM		SAVINGS or	VEADOE	DISCOUNT	DISCOUNTED	
	IICM			YEAR OF OCCURRENCE (2)	DISCOUNT	DISCOUNTED SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	с.		\$0	0	0.00	\$0	
	d TOTAL		\$0 \$0	J	0.00	\$0	
C	TOTAL NONENERGY	DISCOUNTED SAVIN	•		(3A2 + 3Bd4) =	Ψ	, \$0
0.	TOTALIONENERGY	DIOCCONTED CATIN	145 01 0001		(0/2 + 3504) =		ΨΟ,
4 SII	MPLE PAYBACK (SPE	3) - (YRS)		16//	(2G3 + 3A + (3Bd1/15)) =		7.7
	OTAL NET DISCOUNT	, , ,		, 4,			
	VINGS-TO-INVESTM				(2G5 + 3C) =		\$27,245
		• •	I (AIDD) (O()		(5/1G) =		1.83
/ AL	DJUSTED INTERNAL	HATE OF RETURN	N (AIHH) - (%)	((1+.04) x SIR to	1/15 power - 1] x 100 =		8.27

							1
	LOCATION: FORT	CARSON, COLC	RADO	REGION:	4	PROJECT NO:	`
	PROJECT TITLE: F	FT CARSON EEA	P UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO #19 - RADIA	ATOR CONTROLS		BUILDING NO.:	S-6240
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE:		PREPARED BY:	
		- , - · · · ·					
1 IN	IVESTMENT COSTS						
	CONSTRUCTION COST		=			\$15,447	
	SIOH COST		= (5.5% of 1A) =			\$15,447 \$850	
	DESIGN COST		(5.0% of 1A) =			\$927	
	TOTAL COST		(0.0 % of 12) = (1A + 1B + 1C) =			\$17,224	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EX	ISTING EQUIP	=			\$0	
	TOTAL INVESTMENT	· · · · · · · ·	(1D - 1E - 1F) =				\$17,224
 -	· · · · · · · · · · · · · · · ·		,,-			,	. i lmgo.⊥
2 =1	JERGY SAMMOS (1)	COST (A					
	NERGY SAVINGS (+) or 1 ATE OF NISTIR 85-3273-X U	• •	NT FACTORS: C	YCTORED 1000			
UA	ATE OF NISTIN 85-32/3-X U ENERGY	COST	NIFACTORS: C SAVINGS		DISCOUNT	DISCOURITED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)		FACTOR (4)		
Δ	ELEC	\$7.32	אוטוט/זא (<i>צ</i>)	SAVINGS (3)	11.70	• • •	
	DIST	Ψr.32		\$0 \$0	13.78	• -	
	NAT GAS	\$3.48	550.61	\$0 \$1,914	14.16	•	
	COAL	₩.70	350,01	\$1,914 \$0	14.16	\$27,101 \$0	
	SOLAR			\$0 \$0	11.37	\$0 \$0	
	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0 \$0	(
	TOTAL	, ,	550.61	\$1,914	31.0 6	φυ >	\$27,101
			323101	4.10.1			
3 NC	ONENERGY SAVINGS (+	+) or COST (-)					
	ANNUAL RECURRING	, · ()				\$0	
Α.	1 DISCOUNT FACTOR			(From Table A-2) =	11.12	φυ	
	2 DISCOUNTED SAVING	S of COST		$(3A \times 3A1) =$	11.12	\$0	
				(UT A UMI) =		φО	
В.	NONRECURRING						
	ITEM		SAVINGS or		DISCOUNT	DISCOUNTED	
	_		11	OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0 \$0	0	0.00	\$0	
	C.		\$0 \$0	0	0.00	\$0	
^	d TOTAL	COUNTED ON THE	0 \$		/0.40 CP 10	\$0	**
U.	TOTAL NONENERGY DIS	SAVING	as or COST		(3A2 + 3Bd4) =		\$0
4 51	MPLE PAYBACK (SPB) -	· (YRS)		10//0	2G3 + 3A + (3Bd1/15)) =		9.0
				10/(2			
	DTAL NET DISCOUNTED				(2G5 + 3C) =		\$27,101
	VINGS-TO-INVESTMEN	• •			(5/1G) =		1.57
7 AD	DJUSTED INTERNAL RA	TE OF RETURN	(AIRR) - (%)	((1+.04) x SIR to 1	1/15 power - 1] x 100 =		7.19

	LOCATION: FORT	CARSON, COL	ORADO	REGION:	4	PROJECT NO:	
		FT CARSON EE				FISCAL YEAR:	1992
	DISCRETE PORTION			TOR CONTROLS		BUILDING NO.:	
			200 #19 - PADIA				
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	: 15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
Α.	CONSTRUCTION COST					\$13,370	
	SIOH COST		(5.5% of 1A) =			\$735	
	DESIGN COST		(6.0% of 1A) =			\$802	
D.	TOTAL COST		(1A + 1B + 1C) =			\$14,908	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF EX	CISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$14,908
2 EN	IERGY SAVINGS (+) or	COST (-)			•		
DA	TE OF NISTIR 85-3273-X I	USED FOR DISCO	UNT FACTORS: C	CTOBER 1992			
•	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
	ELEC	\$7.32		\$0	11.70	\$0	
В.	DIST			\$0	13.78	\$0	
C.	NAT GAS	\$ 3.48	553.54	\$1,924	14.16	\$27,245	
D.	COAL			\$0	11.57	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		553.54	\$1,924		>	\$27,245
3 NC	ONENERGY SAVINGS ((4) or COST (4)					
	ANNUAL RECURRING	(+) 6, 6667 (-)				¢0	
<u> </u>	1 DISCOUNT FACTOR			/From Toble A 2) -	11.12	\$0	
	2 DISCOUNTED SAVING	SS or COST		(From Table A-2) = $(3A \times 3A1) =$	11.12	\$0	
_		35 01 0031		(3A X 3A1) =		\$ 0	
8.	NONRECURRING						
	ITEM		SAVINGS or		DISCOUNT		
			• •	OCCURRENCE (2)		SVGS or COST (4)	
	a. L		\$0	0	0.00		
	b.		\$0	0	0.00		
	c. d TOTAL		\$0 \$0	0	0.00	•	
C	TOTAL NONENERGY DI	SCOLINTED SAVUA	\$0 T200 00		(0.4.0	\$0	
O .	TOTAL NONENEAGT DI	SCOON ED SAVII	ids of COST		(3A2 + 3Bd4) =		\$0
4 SII	MPLE PAYBACK (SPB)	- (YRS)		1G/(2G3 + 3A + (3Bd1/15)) =		7.7
	TAL NET DISCOUNTE				(2G5 + 3C) =		\$27,245
6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)			(5/1G) =		1.83
7 AC	JUSTED INTERNAL RA	ATE OF RETURN	N (AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		8.27

LOCATION: FORT CARSON, COLORADO REGION: 4 PROJECT NO: PROJECT TITLE: FT CARSON EEAP UPDATE FISCAL YEAR: 19 DISCRETE PORTION NAME: ECO #19 - RADIATOR CONTROLS BUILDING NO.: S. ANALYSIS DATE: 07/01/93 ECONOMIC LIFE: 15 PREPARED BY: A. 1 INVESTMENT COSTS A. CONSTRUCTION COST = \$10,385 B. SIGH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992 ENERGY COST SAVINGS ANNUAL\$ DISCOUNT DISCOUNTED	
DISCRETE PORTION NAME: ECO #19 - RADIATOR CONTROLS ANALYSIS DATE: 07/01/93 ECONOMIC LIFE: 15 PREPARED BY: A 1 INVESTMENT COSTS A. CONSTRUCTION COST = \$10,385 B. SICH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	3-6244 A. NIEMEYER
ANALYSIS DATE: 07/01/93 ECONOMIC LIFE: 15 PREPARED BY: A. 1 INVESTMENT COSTS A. CONSTRUCTION COST = \$10,385 B. SIOH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	A. NIEMEYER
ANALYSIS DATE: 07/01/93 ECONOMIC LIFE: 15 PREPARED BY: A. 1 INVESTMENT COSTS A. CONSTRUCTION COST = \$10,385 B. SIOH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	
1 INVESTMENT COSTS A. CONSTRUCTION COST = \$10,385 B. SIOH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	
A. CONSTRUCTION COST = \$10,385 B. SIOH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
A. CONSTRUCTION COST = \$10,385 B. SIGH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
B. SIOH COST (5.5% of 1A) = \$571 C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
C. DESIGN COST (6.0% of 1A) = \$623 D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
D. TOTAL COST (1A + 1B + 1C) = \$11,579 E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) = \$0 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
E. SALVAGE VALUE = \$0 F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) => 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
F. SALVAGE VALUE OF EXISTING EQUIP. = \$0 G. TOTAL INVESTMENT (1D - 1E - 1F) => 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$11,579
G. TOTAL INVESTMENT (1D - 1E - 1F) => 2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	\$ 11,579
2 ENERGY SAVINGS (+) or COST (-) DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	•
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	
DATE OF NISTIR 85-3273-X USED FOR DISCOUNT FACTORS: OCTOBER 1992	
SOURCE \$/MBTU (1) MBTU/YR (2) SAVINGS (3) FACTOR (4) SAVINGS (5)	
A. ELEC \$7.32 \$0 11.70 \$0	
B. DIST \$0 13.78 \$0	
C. NAT GAS \$3.48 590.24 \$2,052 14.16 \$29,052	
D. COAL \$0 11.57 \$0	
E. SOLAR \$0 \$0	
F. DEMAND SAVINGS \$69.68 / year \$0 11.12 \$0	
G. TOTAL 590.24 \$2,052	\$29,052
3 NONENERGY SAVINGS (+) or COST (-)	
A. ANNUAL RECURRING \$0	
1 DISCOUNT FACTOR (From Table A-2) = 11.12	
2 DISCOUNTED SAVINGS or COST (3A x 3A1) = \$0	
B. NONRECURRING	
ITEM SAVINGS or YEAR OF DISCOUNT DISCOUNTED	
COST (1) OCCURRENCE (2) FACTOR (3) SVGS or COST (4)	
a. \$0 0 0.00 \$0	
b. \$0 0 0.00 \$0	
c. \$0 0 0.00 \$0	
d TOTAL \$0 \$0	
C. TOTAL NONENERGY DISCOUNTED SAVINGS or COST (3A2 + 3Bd4) =	\$0
4 CIMPLE DAVDACK (CDD) AVDC)	F 0
4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) =	5.6
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) =	\$29,052
	2.51
6 SAVINGS-TO-INVESTMENT RATIO (SIR) (5/1G) =	

	LOCATION: FOI	RT CARSON, COL	.ORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EE					1992
	DISCRETE PORTIO			ATOR CONTROLS		BUILDING NO.:	
			ECO#19 - RADIA				
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	: 15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION CO	ST	=			\$14,279	
	SIOH COST		(5.5% of 1A) =			\$785	
C.	DESIGN COST		(6.0% of 1A) =			\$857	
D.	TOTAL COST		(1A + 1B + 1C) =			\$15,921	
E.	SALVAGE VALUE					\$0	
F.	SALVAGE VALUE OF	EXISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$15,921
2 EN	IERGY SAVINGS (+)	or COST (-)					
DA	TE OF NISTIR 85-3273-	X USED FOR DISCO	UNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	11.70	\$0	
В.	DIST			\$0	13.78	\$0	
C.	NAT GAS	\$3.48	589.55	\$2,049	14.16	\$29,018	
D.	COAL			\$0	11.57	\$0	
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		589.55	\$2,049		>	\$29,018
3 NC	ONENERGY SAVING	S (+) or COST (-)					
	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTO			(From Table A-2) =	11.12	•	
	2 DISCOUNTED SAV			(3A x 3A1) =	2	\$0	
В	NONRECURRING			, ,		·	
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$0	0	0.00	\$0	
	b.		\$0	0	0.00	\$0	
	c.		\$0	0	0.00	\$0	
	d TOTAL		\$0			\$0	
C.	TOTAL NONENERGY	DISCOUNTED SAVI	NGS or COST		(3A2 + 3Bd4) =		\$0
	MPLE PAYBACK (SP			1G/(2G3 + 3A + (3Bd1/15)) =		7.8
5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) = \$29							
6 SA	VINGS-TO-INVESTA	MENT RATIO (SIR)			(5/1G) =		1.82
7 AD	JUSTED INTERNAL	RATE OF RETURI	N (AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		8.25

						•	ļ
	LOCATION: FOR	T CARSON, COLC	RADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	PUPDATE			FISCAL YEAR:	1992
	DISCRETE PORTIO	N NAME: E	CO #19 - RADIA	TOR CONTROLS		BUILDING NO.:	S-6254
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE:	:15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
A.	CONSTRUCTION COST	т	=			\$13,370	
В.	SIOH COST		(5.5% of 1A) =			\$735	
C.	DESIGN COST		(6.0% of 1A) =			\$802	
D.	TOTAL COST		(1A + 1B + 1C) =			\$14,908	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE OF E	EXISTING EQUIP.	=			\$0	i.
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$14,908
0 E.	IEDOV SAVANOS ()	w COST ()					
	IERGY SAVINGS (+) o .TE OF NISTIR 85-3273-X	* *	NT FACTORS: O	CTOBER 1992			
24	ENERGY	COST	SAVINGS		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)		FACTOR (4)		
A	ELEC	\$7.32		\$0	11.70	• •	
	DIST	41.02		\$0	13.78		
	NAT GAS	\$3.48	553.54	•	14.16	•	
	COAL	, 0.40	330.04	\$0	11.57	-	
	SOLAR			\$0	11.07	\$0	
	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	· -	
	TOTAL		553.54	•	* * * * &	·····>	407.045
	\\	(A) 000T (
	ONENERGY SAVINGS					* -	
A.	ANNUAL RECURRING				- د د م. - د د م.	\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	11.12		
	2 DISCOUNTED SAVIN	NGS of COST		(3A x 3A1) =		\$0	1
В.	NONRECURRING		CALIBRA	VE+5 -5	DISCOURT.	DISCOURTE	
	ITEM		SAVINGS or		DISCOUNT		
	•			OCCURRENCE (2)		SVGS or COST (4)	
	a. h		\$0 \$0	0	0.00	\$0 \$0	
	b.		\$0 \$0				
	C.		\$0 \$0		0.00	\$0 \$0	
C.	d TOTAL TOTAL NONENERGY D	DISCOUNTED SAVING	\$0 GS or COST		(3A2 + 3Bd4) =		\$0
٥.					, 		43
4 SII	MPLE PAYBACK (SPE	3) - (YRS)		1G/(2	2G3 + 3A + (3Bd1/15)) =		7.7
5 TC	TOTAL NET DISCOUNTED SAVINGS				(2G5 + 3C) =		\$27,245
6 SA	VINGS-TO-INVESTMI	ENT RATIO (SIR)			(5/1G) =		1.83
7 AD	JUSTED INTERNAL F	RATE OF RETURN	(AIRR) - (%)	[(1+.04) x SIR to	1/15 power - 1] x 100 =		8.27

	LOCATION: FORT CARSON, COLORADO			REGION:	4	PROJECT NO:	
	PROJECT TITLE:	FT CARSON EEA	P UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO #19 - RADIA	TOR CONTROLS		BUILDING NO.:	S-6255
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	: 15	PREPARED BY:	A. NIEMEYER
1 INVESTMENT COSTS							
	CONSTRUCTION COST					\$20,120	
	SIOH COST		= = (5.5% of 1A)			\$20,120 \$1,107	
	DESIGN COST (6.0% of 1A) =					\$1,207	
	TOTAL COST (1A + 1B + 1C) =					\$22,434	
	SALVAGE VALUE		=			\$0	
	SALVAGE VALUE OF EX	ISTING EQUIP.	=			\$0	
	TOTAL INVESTMENT (1D - 1E - 1F) =					>	\$22,434
			(,				V , · · ·
0 ENERGY 04/4/100 () = 000T ()							
2 ENERGY SAVINGS (+) or COST (-)							
DA	TE OF NISTIR 85-3273-X U	USED FOR DISCOU COST			DICCO! 12 T	DIGGG! BEED	
	ENERGY SOURCE		SAVINGS		DISCOUNT	DISCOUNTED	
۸	ELEC	\$/MBTU (1) \$7.32	MBTU/YR (2)	SAVINGS (3) \$0	FACTOR (4) 11.70	SAVINGS (5) \$0	
	DIST	\$1.32		\$0 \$0	13.78	\$0 \$0	
	NAT GAS	\$3.48	691.49		14.16	\$34,035	
	COAL	\$3.40	091.49	\$2, 404 \$0	11.57	\$34,033 \$0	
	SOLAR			\$0 \$0	11.57	\$0 \$0	
		\$60.69 / year		-	11.12	-	
	DEMAND SAVINGS TOTAL	\$69.68 / year	691.49	\$0 \$2,404	11.12	\$0	\$34,035
G.	TOTAL		. 031.43	\$2,404		>	\$34,030
	ONENERGY SAVINGS (
A.	ANNUAL RECURRING					\$0	
	1 DISCOUNT FACTOR			(From Table A-2) =	11.12		
	2 DISCOUNTED SAVING	GS or COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
			COST (1)	OCCURRENCE (2)	FACTOR (3)	SVGS or COST (4)	ı
	a.	•	\$0	0	0.00	\$0	ı
	b.		\$0	0	0.00	\$0	ı
	c.		\$0	0	0.00	\$0	ı
	d TOTAL		\$0			\$0	ı
C.	TOTAL NONENERGY DI	SCOUNTED SAVING	GS or COST		(3A2 + 3Bd4) =		\$0
4 SIMPLE PAYBACK (SPB) - (YRS)				1G/(2G3 + 3A + (3Bd1/15)) =		9.3
5 TOTAL NET DISCOUNTED SAVINGS					(2G5 + 3C) =		\$34,035
6 SA	VINGS-TO-INVESTME	NT RATIO (SIR)			(5/1G) =		1.52
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%) [(1+.04) x SIR to 1/15 power - 1] x 100 =							6.93

LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

						•	
	LOCATION: FORT	REGION:	4	PROJECT NO:			
	PROJECT TITLE:	FT CARSON EEA	P UPDATE			FISCAL YEAR:	1992
	DISCRETE PORTION	NAME: E	CO #19 - RADIA	ATOR CONTROLS		BUILDING NO.:	ALL BLDGS
	ANALYSIS DATE:	07/01/93		ECONOMIC LIFE	:15	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COSTS						
	CONSTRUCTION COST		=			\$236,769	ı
	SIOH COST		- (5.5% of 1A) =			\$13,022	
C.	DESIGN COST		(6.0% of 1A) =			\$14,206	
D.	TOTAL COST		(1A + 1B + 1C) =			\$263,997	
E.	SALVAGE VALUE					\$0	
F.	SALVAGE VALUE OF EX	(ISTING EQUIP.	=			\$0	
G.	TOTAL INVESTMENT		(1D - 1E - 1F) =			>	\$263,997
2 EN	IERGY SAVINGS (+) or	COST (-)					
	TE OF NISTIR 85-3273-X (NT FACTORS: C	OCTOBER 1992			
	ENERGY	COST	SAVINGS		DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32		\$0	11.70	\$0	
В.	DIST			\$0	13.78	\$0	
C.	NAT GAS	\$3.48	9874.72	\$34,325	14.16	\$486,035	
D.	COAL			\$0	11.57	\$0	
	SOLAR			\$0		\$0	
	DEMAND SAVINGS	\$69.68 / year		\$0	11.12	\$0	
G.	TOTAL		9874.72	34,324.5		>	\$486,035
a 110							
	NENERGY SAVINGS ((+) or COST (-)					
A.	ANNUAL RECURRING				44.40	\$0	
	1 DISCOUNT FACTOR	Se en COST		(From Table A-2) =	11.12		
	2 DISCOUNTED SAVING	33 01 COST		(3A x 3A1) =		\$0	
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a.		\$0		0.00	\$0	
	b.		\$0	0	0.00	\$0	
	C.		\$0	0	0.00	\$0	
_	d TOTAL	2001 BITES 641	\$0		/max = ====	\$0	
C.	TOTAL NONENERGY DIS	SCOUNTED SAVING	is or COST		(3A2 + 3Bd4) =		\$0
4 SIN	MPLE PAYBACK (SPR)	- (YRS)		16//2	PG3 + 3A + /3Bd1/tE\\ -		7.7
4 SIMPLE PAYBACK (SPB) - (YRS) 1G/(2G3 + 3A + (3Bd1/15)) =							
	5 TOTAL NET DISCOUNTED SAVINGS (2G5 + 3C) =						\$486,035
	VINGS-TO-INVESTME	- •			(5/1G) =		1.84
7 ADJUSTED INTERNAL RATE OF RETURN (AIRR) - (%) [(1+.04) x SIR to 1/15 power - 1] x 100 =							8.32

CONSTRUCTION COST ESTIMAT	Έ		DATE PREPAR			CUEET 4	3E 4
Project FT CARSON EEAP UPDATE				13-Apr-93	BASIS FOR ES		OF 1
Location FORT CARSON, COLORADO			Code A (No des Code B (Prelimi	nary design)			
Architect-Engineer E M C ENGINEERS, INC., 2750 S. WA	DSWORTH	BIVD D	ENVER CO 802	27		Code C (Final do	esign)
Drawing No.	D 311011111	Estimate	or		Checked by		· · · · · · · · · · · · · · · · · · ·
ECO #19	Quant		MEYER Labor		T. FORSTER Mater		
Radiator Controls	No. Units	Unit Meas.	Per Unit	Total	Per Unit	Total	Total Cost
Remove Existing Rad. Control Valve	1	EA	5.70	5.70			\$5.70
Install Thermostatic Control Valve	1	EA	22.81	22.81	61.46	61.46	\$84.27
with Operator (16' capillary tube extension)							
Subtotal - Direct Costs per Installation				28.51		61.46	89.97
Overhead, Bond, Ins. (16.8%)							\$15.11
Workers Comp. Ins. (7.7%)							\$2.20
Profit (10%)							\$10.73
Contingency (10%)							\$11.80
TOTAL PER UNIT							\$129.81
·	No.	Unit	Labor and Ma	aterial with Ov	erhead, Profit,	and Cont.	Total Contract
BUILDING NO.	Units	Meas.				Totai	Cost
S-6220	52	EA				\$129.81	\$6,749.99
S-6221	31	EA				\$129.81	\$4,024.03
S-6222	98	EA				\$129.81	\$12,721.14
S-6223	73	EA				\$129.81	\$9,475.95
S-6224	173	EΑ				\$129.81	\$22,456.71
S-6236	150	EA				\$129.81	\$19,471.14
S-6237	150	EA				\$129.81	\$19,471.14
S-6243	103	EA				\$129.81	\$13,370.18
S-6230	118	EA				\$129.81	\$15,317.29
S-6231	103	EA				\$129.81	\$13,370.18
S-6235	103	EA		W*		\$129.81	\$13,370.18
S-6240	119	EA		,		\$129.81	\$15,447.10
S-6241	103	EA				\$129.81	\$13,370.18
S-6244	80	EA				\$129.81	\$10,384.61
S-6252	110	EA		, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,, ,		\$129.81	\$14,278.83
S-6254	103	EA				\$129.81	\$13,370.18
S-6255	155	EA				\$129.81	\$20,120.17
TOTAL ECO #19							\$236,769.00
					,		
ENG FORM 150 1 AUG Se			C4 10		*U.\$. GO	VERNMENT PRINTING OF	FFICE 1959 0-516148

EMC ENGINEERS, INC. **ENERGY SAVINGS ESTIMATE - ECO #19 UPGRADE RADIATOR CONTROLS**

PROJECT: LOCATION: **UPDATE EXISTING EEAP STUDY**

FORT CARSON, COLORADO

CLIENT PROJECT NO: EMC PROJECT NO:

CLIENT PROJECT ENG:

R.W. WHITE

PHASE:

FINAL

S-6237

S-6243

2102-001

PREPARED BY: A. NIEMEYER

DATE:

01-Jul-93

Page 1 of 1

PRIMARY BLDG. NO.	ENERGY SAVINGS (MBTU/YR)	NO. OF RAD.	BLDG. (SF)	ENERGY SAVINGS PER SF (MBTU/YR
S-6220	412.25	52	12361	0.0334
BLDG. NO.	NO. OF RAD.	BLDG. (SF)	ENERGY SAVINGS PER SF (MBTU/YR)	TOTAL ENERGY SAVINGS (MBTU/YR
S-6221	31	5798	0.0334	193.37
S-6222	98	19225	0.0334	641.17
	73	9574	0.0334	319.30
S-6223	, ,	1		l
S-6223 S-6224	173	24548	0.0334	818.70

22360

25490

150

103

PRIMARY BLDG. NO.	ENERGY SAVINGS (MBTU/YR)	NO. OF RAD.	BLDG. (SF)	ENERGY SAVINGS PER SF (MBTU/YR)
S-6230	591.45	118	21450	0.0276
	•			
BLDG.	NO. OF		ENERGY SAVINGS	TOTAL ENERGY
NO.	RAD.	BLDG.	PER SF	SAVINGS
		(SF)	(MBTU/YR)	(MBTU/YR)
S-6231	103	20075	0.0276	553.54
S-6235	103	20075	0.0276	553.54
S-6240	119	19969	0.0276	550.61
S-6241	103	20075	0.0276	553.54
S-6244	80	21406	0.0276	590.24
S-6252	110	21381	0.0276	589.55
S-6254	103	20075	0.0276	553.54
S-6255	155	25078	0.0276	691.49

TOTAL ENERGY SAVINGS FOR ECO #19 (MBTU/YR)

9874.72

745.73

850.11

0.0334

0.0334

THE ENGINEE	. TNC	BC	EP IN	PUT	FORM		ENVED	COLORADO
EMC ENGINEE	.KS, INC. XISTING INPUT FILE (XXXXXX.INI			- 12	IN CHART FOR		
NEW (1) EXISTING (2)	6220, IN					FCBI		·
PROJECT DESCRIPT	ION (20 CHAR) PDATE EEAP		E DESCRIPTION		₹)	CASE o	r ECM #	DATE (mm/dd/yy) 6/28/93
PREPARED BY:	(6C) BUILDING NAME:		TOTAL FLOOR		# 0F Z	ONES Z	ONE NUMBER	
AJN	5-6220		12,36		/	(i)		(I) SYSTEM MO
HEATING MO	NTH ON (00-12) MONTH	_		ACTOR FL	JEL TYPE		CAPACITY 4, 000(R)	2 4444
PART LOAD 1 2 POINTS (R) /0 /10	3 4 5 6 7	-S (1 8 9	10 11 8	FFICIENCY POINTS (R	1 2	3 4 !		8 9 IO II
COOLING	NTH ON (00-12) MONT	rok .	1	Fl	JEL TYPE	{	CAPACITY Ø (R)	# PART LOAD PTS.
PART LOAD 2	3 4 5 6 7	8 9		FFICIENCY POINTS		3 4 5		8 9 10 II
BIN Nº HEATING BEGIN	NS BIN Nº COO	OLING BEGI	NS (i)	HEAT NON-	-WORK HO	URS ?	COOL NON-	WORK HOURS?
CONDUCTION	RUN THIS ZONE ?					SOLAR S	RAD DISK FI	LĘ:
	NORTH	F	WALL	S SOUTH	······································	WES		ROOF
AREA (R)	2995,2		78.8	300	-	63		5747.0
U-VALUE (R)	0.24		.24	0,2		0.	24	0,069
COLOR ADJUSTMENT FACTOR (R)	0.65	0.	65	0.6	5	0.6	65	0.8
CLTD (I)	Ø		\$	ø		ø		φ
EXTERNAL SHADE FACTOR (R)	0.3	1	.9		9'	1.0		1.0
ATTIC VENT	ILATION ?	1	POSSIBLE SUI	,0	HINE (R)	PERCENT P	66.0	ITER SUNSHINE (R)
	N NE	GLA E	SS (VERTICAL SE	.) 	sw	w	NW	SKYLIGHT or ROOF GLASS
AREA (R)	434.8	359.2		423,2		307.0		*
U-FACTOR (R)	0.568	0.568	,	0.568		0.568		
SHADING (R) COEFFICIENT	0.88	0.88		0.88		6.88		
COOLING LOAD (R)	11.53	5,47	·	6.43		5-47		
MAX SHGF, (I) SUMMER	38	216		109		216		
MAX SHGF, (I)	20	154		254		154		
EXTERNAL SHADE FACTOR (R)		0.9		0.9		1.0		
	747.0 (R) 0.1	453 (E CRAWL SP R) S 50.	0 w	50.0	(R)		ETER LENGTH (R)
TEMP RANGE	DESIGN D	AY TEMPE	RATURE (R)	SPACE HEAD	TING TEMP		SPACE COOL	ING TEMPERATURE (R)
CONVECTION %	ELEVATION AIR	FLOW RAT	ES-OCCUP/U	NOCUP 78 ACFM(HEATING	GAIR TEMP	(R) COOL	LING AIR TEMP (R)
	RUN THIS ZONE ? Nº of		DHW (i)	INTER	NAL GAIN			(4) PEOPLE (5)
FUEL	TYPE	(1)	3	1			/	
DAY: BTUH		(8)	45 77.0	39,22	9.0		29,42	
	ER OF UNITS	(I) (R)	1 0 001	0.	g		1.0	1,0
	CULE CORRECTION FACT		1,0	1,0			1,0	1.0
NIGHT: BTUH	/ UNIT	(R)	4577.0	T			29,42	1.0 0
<u></u>	ER OF UNITS	(1)		/			/	<u>ø</u>
	E LOAD FACTOR DULE CORRECTION FAC	(R)	0.001	0.9			0.05	1.0 5 Ø
ll ——	CIENCY	(R)	0.001 68.86	100.			100.0	
<u> </u>	XX.IN) 6220.I	7V				(XXXXXX.RF		o, RPT

BUILDING--S-6220 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN

******	BIN HEATING	AND COOLING	*****
*****	LOADS	REPORT	*******
******	BUILDING	BOUNDARY	*******

BIN		HO	URS	MECH HEAT	ING LOADS	MECH COOL	ING LOADS
F		7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
				MBTU	\mathtt{MBTU}	MBTU	MBTU

-25 to		0	0	.0000	.0000	.0000	.0000
	-15	0	0	.0000	.0000	.0000	.0000
-15 to	-10	0	0.	.0000	.0000	.0000	.0000
-10 to	- 5	0	2	.0000	1.0242	.0000	.0000
-5 to	0	0	8	.0000	3.8620	.0000	.0000
0 to	5	15	94	5.7100	42.6010	.0000	.0000
5 to	10	17	121	5.9703	51.3590	.0000	.0000
10 to	15	37	168	11.9130	66.4750	.0000	.0000
15 to	20	55	303	16.0940	111.0400	.0000	.0000
20 to	25	97	376	25.5560	126.8000	.0000	.0000
25 to	30	112	486	26.1580	149.5800	.0000	.0000
30 to	35	94	353	19.1950	98.2880	.0000	.0000
35 to	40	144	407	25.1560	100.6500	.0000	.0000
40 to	45	135	493	19.5300	102.4800	.0000	.0000
45 to	50	181	594	19.9280	100.7800	.0000	.0000
50 to	55	175	556	13.4600	70.7110	.0000	.0000
55 to	60	178	563	8.9795	44.4390	.0000	.0000
60 to	65	192	621	.0000	.0000	.0000	.0000
65 to	70	210	521	.0000	.0000	.0000	.0000
70 to	75	193	327	.0000	.0000	.0000	.0000
75 to	80	192	220	.0000	.0000	.0000	.0000
80 to	85	163	114	.0000	.0000	.0000	.0000
85 to	90	135	74	.0000	.0000	.0000	.0000
90 to	95	15	19	.0000	.0000	.0000	.0000
95 to	100	0	0	.0000	.0000	.0000	.0000
100 to	105	Ö	Ö	.0000	.0000	.0000	.0000
		-					
ANN		2340	6420	197.6497	1070.0880	.0000	.0000

BUILDING--S-6220 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY HEATING AND COOLING	******
******	LOADS REPORT	******
*****	BUILDING BOUNDARY	******

MONTH	MECH HEAT	ING LOADS	MECH COOLI	MECH COOLING LOADS		
	7 - 16	17 - 6	7 - 16	17 - 6		
	MBTU	MBTU	MBTU	MBTU		
01 JAN	39.8750	178.6100	.0000	.0000		
02 FEB	36.2680	160.4200	.0000	.0000		
03 MAR	27.5090	146.0200	.0000	.0000		
04 APR	15.4900	95.5310	.0000	.0000		
05 MAY	6.7159	65.5710	.0000	.0000		
06 JUN	.0000	.0000	.0000	.0000		
07 JUL	.0000	.0000	.0000	.0000		
08 AUG	.0000	.0000	.0000	.0000		
09 SEP	2.5831	44.9660	.0000	.0000		
10 OCT	5.8988	88.7290	.0000	.0000		
11 NOV	33.5350	141.7400	.0000	.0000		
12 DEC	29.7760	148.5000	.0000	.0000		
ANN	197.6497	1070.0880	.0000	.0000		

Building Boundary Energy per Square Foot of Total Building area = 102559.5 BTU

BUILDING--S-6220 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN

*****	BIN SOLAR ENERGY REPORT	******
******	DIRECT GAIN THROUGH	******
******	WINDOWS AND SKYLIGHTS	******

BIN F	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16 MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	15	1.0434
5 to 10	17	1.1749
10 to 15	37	2.5407
15 to 20	55	3.7523
20 to 25	97	6.5745
25 to 30	112	7.5413
30 to 35	94	6.2875
35 to 40	144	9.5678
40 to 45	135	8.9097
45 to 50	181	11.8651
50 to 55	175	11.3938
55 to 60	178	11.5099
60 to 65	192	12.3298
65 to 70	210	13.3922
70 to 75	193	12.2222
75 to 80	192	12.0734
80 to 85	163	10.1772
85 to 90	135	8.3689
90 to 95	15	.9232
95 to 100	0	.0000
100 to 105	0	.0000
ANN	2340	151.6478

BUILDING--S-6220 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN

******	MONTHLY	INTERNA	L GAINS	REPORT:	******
******	LOADS	AND RAW	SOURCE	ENERGY	******
*******		CONSU	*****		

MONTH	DHW	LIGHTS	MISC	PEOPLE
	NAT GAS	ELEC	ELEC	
	MBTU	MBTU	MBTU	MBTU
01 J	.8676	.5890	.5133	1.8314
02 F	.8261	.5521	.4889	1.7442
03 M	.9499	.6280	.5622	2.0058
04 A	.8675	.5832	.5133	1.8314
05 M	.9087	.6085	.5378	1.9186
06 J	.9086	.6027	.5378	1.9186
07 J	.8676	.5890	.5133	1.8314
08 A	.9499	.6280	.5622	2.0058
09 S	.9086	.6027	.5378	1.9186
10 O	.8676	.5890	.5133	1.8314
11 N	.9086	.6027	.5378	1.9186
12 D	.9087	.6085	.5378	1.9186
TOT	10.7396	7.1836	6.3554	22.6746
RAW SOURCE	15.5962	24.4155	21.6007	22.6746

BUILDING--S-6220 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN ALL ZONES CASE #0

*****	MONTHLY HEATING	AND COOLING	*****
******	RAW SOURCE	ENERGY	******
******	CONSUMPTION	REPORT	******

MONTH	TOT	AL HEATING NAT GAS MBTU	TO	TAL COOLING
01 J 02 F 03 M 04 A 05 M 06 J 07 J 08 A 09 S 10 O 11 N 12 D	authorizen	317.5708 285.8792 252.2219 161.3673 105.0677 .0000 .0000 .0000 69.1119 137.5409 254.7613 259.1212		.0000 .0000 .0000 .0000 .0000 .0000 .0000 .0000
ANN BTU/SF/YR		1842.6420	COOLING:	.0000

Raw Source Energy per Square Foot of Total Building Area = 149069.0 BTU

EMC ÉNC	TAIF		10	TAI	C			BC	E	P	11	1P	TU	F	OF	3IV	1	1	TEN	VED) (COLO	אסגר	nn	
EMC ÉNG	INI		(S)	TIN	U.	i e	799	N.XXXX	n .			_				T A	IN CHA								
NEW	(I)	۲		22					17			-		•		۱	III GIA			1113 21	JI4 ,		w	,	
EXISTING(PROJECT DE		PTIC				<u>· +</u>			SE	DES	CRIPT	ION	(20 C	HAR)		To	CASE	or E	CM #		DAT	E (mm	/dd/y	(y)
i noccor bi				LO 01				1 7					Cour									4	4/8	3 /9	33
PREPARED BY:		(6	C)	BUILD	ING I	MAME							AREA			OF Z		(,)	ZONE	NUN		, , ,	FAN	ì	Y
LICATING		NON	TH O	N (OC	12)	MON	тн о	FF (OI-	2)	DD	CORR	FA	CTOR	FUE	LTY	PE			T. CA	APACI	TY	# PA	RT L		TS MIN
HEATING					(1)			ı	(1)				· (R)		,		(1)				(R)	<u> </u>		111	MAX
PART LOAD POINTS (R)	2		3 ·	4	5	6	7	8 6	Ì	Ю	111		FFICIEN DINTS	(R)		2	3	4	5	6	7	8	9		"
COOLING	٨	4ON	TH C	N (OC)-12) (1)	1	тно	FF (01-	(1)					FUE	EL TY	PE	(1)			PACI1	(R)	Ļ	ART L	2 N	AIN AAX
PART LOAD POINTS	2		3	4	5	6	7	8 9		Ю	<u> </u> "	P	FFICIEN			2	3	4	5	6	7	8	9		11
BIN Nº HEATIN	G BE	GINS	S		BIN	Ņº C	:00LI	NG BEG	INS			"	EAT N				JRS ?		CO		ON-V '	WORK N		s?	
			16	(I) RUN T	LIS 7	ONE	7	-			(1)			<u> </u>		N	S	OLAR	RA	DIS			-		
CONDUCT	ION			1011	Υ	N																			
		T		NOO	TL			-	ASI	r	W	W.		JTH				ws	ST				ROOF	-	
AREA	(R	, †		NOR'	117		Т		, M 3			Τ	300	- 111				44.6			十				
U-VALUE	(R	4					+		•			\vdash	•								+				•
COLOR ADJUS	TME!																								
CLTD	(1)						Т																		
EXTERNAL S							十					T			,						\top				
FACTOR ATTIC	(F	_	ATIC	N 7				ERCEN	T PC	ossi	BLE S	L	MER SU	INSH	INE		PERC	ENT	POSS	SIBLE	WIN	TER S	UNSH	INE	
Y			N							;	, !					(R)							OUT.	- 50	(R)
			N			NE		GL.	AS\$	(VI \$1	ERTIC E	AL)	S		SW		w	,		NW		SKYLI	GLAS		OF
AREA	(R)												1							ightharpoons				
U-FACTOR	. (R)																							
SHADING COEFFICIENT	()	R)																							
COOLING LOA FACTOR	O (R)										L									\bot				
MAX SHGF, SUMMER	((1)										L													
MAX SHGF, WINTER	(I)																			\perp				
EXTERNAL SI		RΣ																							
FLOOR O NON TYPE 2 CRAN	E ((2) F	-LOO	RARE	A (R	. 1	LOO	R U-VAL	UE (R)		AWL	SPA	CE TE	MPE Iw	RATU	RE	(R)	3 -	OSE	D PE	RIME	TER	LENG	тн	(R)
TEMP RANGE	,,						DAY	TEMP!			E (F		PACE I	EAT	ING T	EMP		URE	R SA	ACE C	00Li	NG TE		RATUR	
CONVECTION	NC								TES CFM			'UN	ACF		HEA D	70.	AIR O ji	TEMP	0.0	(R) 0		ING A	IR TE	MP	(R)
INTERNAL GAINS					ONE	? Nº	of T	YPES ? (i)		DI	iw (ijΤ		TERN HTS			AVI (3)	MIS	C.	(4)	PEO	PLE	(5)
	FUE	LT						(1)	\vdash	<u> </u>	\	-	-:0		7,445	Ť			+	.,,,,			\leq	\equiv	Ë
DAY:			וואט	<u> </u>				(R)				7				Т			+			一			
				UNIT	s			(1)	Т			7	•			Τ			\top						
	SPA	CE	LOAC	FAC	TOR			(R)	Γ			寸													
	SCH	EDU	ILE (CORRE	CTIC	ON FA	CTOF	(Ft)	Γ																
NIGHT:	вти	JH /	UNIT	7				(R)	Π										T						
	NUN	ABEI	R OF	UNIT	s			(1)	1							Π			\top						
	SPA	ACE	LOA	O FA	CTOF	~		(R)				7							\neg						
	SCI	IED	JLE	CORR	ECT	ION F	ACTO	R (R)	T		····	ヿ				Τ			丁						
			ENC					(R)	Τ							Π	·		\top				>	><	<
INPUT FILE	(xx	ХХХ	X.11	v) (.2	204	TIC	3	'				ΩU	TPU	T FILI	E (XXXX	(XX.I	RPT)	62	<u></u>	. RI	9		

BUILDING--S-6220 ZONE # 1
CASE--ECO #19 - RADIATOR CONTROLS CASE #1
DATE--4/8/93
PREPARED BY--AJN

******	BIN SOLAR ENERGY REPORT	******
******	DIRECT GAIN THROUGH	******
******	WINDOWS AND SKYLIGHTS	******

BIN F	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16 MBTU
-25 to -20	0	.0000
-20 to -15	0	.0000
-15 to -10	0	.0000
-10 to -5	0	.0000
-5 to 0	0	.0000
0 to 5	15	1.0434
5 to 10	17	1.1749
10 to 15	37	2.5407
15 to 20	55	3.7523
20 to 25	97	6.5745
25 to 30	112	7.5413
30 to 35	94	6.2875
35 to 40	144	9.5678
40 to 45	135	8.9097
45 to 50	181	11.8651
50 to 55	175	11.3938
55 to 60	178	11.5099
60 to 65	192	12.3298
65 to 70	210	13.3922
70 to 75	193	12.2222
75 to 80	192	12.0734
80 to 85	163	10.1772
85 to 90	135	8.3689
90 to 95	15	.9232
95 to 100	. 0	.0000
100 to 105	0	.0000
ANN	2340	151.6478

BUILDING--S-6220 ZONE # 1 CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

*****	MONTHLY	INTERNA	L GAINS	REPORT:	******
*****	LOADS	AND RAW	SOURCE	ENERGY	*****
******		CONSU	MPTION		******

MONTH	DHW	LIGHTS	MISC	PEOPLE
	NAT GAS	ELEC	ELEC	
	MBTU	MBTU	MBTU	MBTU
01 J	.8676	.5890	.5133	1.8314
02 F	.8261	.5521	.4889	1.7442
03 M	.9499	.6280	.5622	2.0058
04 A	.8675	.5832	.5133	1.8314
05 M	.9087	.6085	.5378	1.9186
06 J	.9086	.6027	.5378	1.9186
07 J	.8676	.5890	.5133	1.8314
08 A	.9499	.6280	.5622	2.0058
09 S	.9086	.6027	.5378	1.9186
10 O	.8676	.5890	.5133	1.8314
11 N	.9086	.6027	.5378	1.9186
12 D	.9087	.6085	.5378	1.9186
TOT	10.7396	7.1836	6.3554	22.6746
RAW SOURCE	15.5962	24.4155	21.6007	22.6746

BUILDING--S-6220 ALL ZONES CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

******	MONTHLY HEATING AND	COOLING *************
*****	RAW SOURCE ENEI	RGY *************
******	CONSUMPTION REPO	ORT ************

MONTH	TOT	AL HEATING	TC	TAL COOLING
		NAT GAS MBTU		MBTU
01 J		259.5408		.0000
02 F		233.4480		.0000
03 M		197.5420		.0000
04 A		117.6497		.0000
05 M		70.4382		.0000
06 J		.0000		.0000
07 J		.0000		.0000
08 A		.0000		.0000
09 S		45.6317		.0000
10 O		99.3530		.0000
11 N		201.4808		.0000
12 D		205.3037		.0000
ANN		1430.3880		.0000
BTU/SF/YR	HEATING:	115717.8	COOLING:	.0

Raw Source Energy per Square Foot of Total Building Area = 115717.8 BTU

BUILDING--S-6230 CASE--BASELINE DATE--11/16/92 PREPARED BY--AJN ZONE # 1 CASE #0

****** ****** ******

BIN HEATING AND COOLING *************** LOADS REPORT BUILDING BOUNDARY

****** ******

	BIN			URS		ING LOADS	MECH COOL	
	F		7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
					MBTU	MBTU	MBTU	MBTU
- 25	+0	-20	0	0	.0000	.0000	.0000	.0000
		- 15	0	0	.0000	.0000	.0000	.0000
		-10	0	0				
	to	-10 -5	0	2	.0000	.0000	.0000	.0000
-10 -5	to	-5	0	8		1.1249	.0000	.0000
-5 0	to	5	15		.0000	4.2579	.0000	.0000
_	to	10	17	94	5.8615	47.1340	.0000	.0000
_	to			121	6.1110	57.1960	.0000	.0000
		15	37	168	12.1610	74.5970	.0000	.0000
15	to	20	55 27	303	16.3660	125.4700	.0000	.0000
	to	25	97	376	25.8810	144.4300	.0000	.0000
	to	30	112	486	26.1890	171.7400	.0000	.0000
30	to	35	94	353	19.0560	114.1000	.0000	.0000
	to	40	144	407	24.6410	118.4200	.0000	.0000
	to	45	135	493	18.5940	122.0200	.0000	.0000
	to	50	181	594	18.3450	122.5100	.0000	.0000
	to	55	175	556	11.5460	88.2280	.0000	.0000
	to	60	178	563	6.5547	57.6640	.0000	.0000
	to	65	192	621	.0000	.0000	.0000	.0000
	to	70	210	521	.0000	.0000	.0000	.0000
70	to	75	193	327	.0000	.0000	.0000	.0000
75	to	80	192	220	.0000	.0000	.0000	.0000
80	to	85	163	114	.0000	.0000	.0000	.0000
85	to	90	135	74	.0000	.0000	.0000	.0000
90	to	95	15	19	.0000	.0000	.0000	.0000
95	to	100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
	NN	*	2340	6420	191.3070	1248.8850	.0000	.0000

BUILDING--S-6230 CASE--BASELINE DATE--11/16/92 PREPARED BY--AJN ZONE # 1 CASE #0

******	MONTHLY HEATING AND COOLING	*******
******	LOADS REPORT	*******
******	BUILDING BOUNDARY	************

MONTH	MECH HEATING LOADS		MECH COOL	ING LOADS
	7 - 16	17 - 6	7 - 16	17 - 6
	MBTU	MBTU	MBTU	MBTU
01 JAN	39.9820	205.2500	.0000	.0000
02 FEB	35.8480	182.9200	.0000	.0000
03 M AR	25.9640	167.8600	.0000	.0000
04 APR	13.8870	112.1900	.0000	.0000
05 MAY	5.2932	78.5330	.0000	.0000
06 JUN	.0000	.0000	.0000	.0000
07 JUL	.0000	.0000	.0000	.0000
08 AUG	.0000	.0000	.0000	.0000
09 SEP	2.1268	55.7520	.0000	.0000
10 OCT	5.3225	107.4700	.0000	.0000
11 NOV	33.3520	165.5700	.0000	.0000
12 DEC	29.5310	173.3400	.0000	.0000
ANN	191.3070	1248.8850	.0000	.0000

Building Boundary Energy per Square Foot of Total Building area = 67141.8 BTU

EMC ENC	T & +	DC TN		BC	EP IN	PUT	FORM		NENIVED	COLORADO -
EMC ENG			U. Utfile ()	, VVVVV	· ·		<u> </u>			(XBINXX.XX)
NEW EXISTING		623			:			FCBI	N.2	
PROJECT DE	SCRIPT	10N (20 CH	AR)		SE DESCRIPTI		R)	CASE	or ECM #	DATE (mm/dd/yy)
FT CARSO		(a.a) Tai a.) # OF	701/50 13	Ø ONE NUMBE	6/28/93
PREPARED BY:	,	(6C) BUILDI	ng name: -62 <i>3</i> 0	(60)	TOTAL FLOOR 2145		# OF /	20NES 2	ONE NUMBE	SYSTEM N
HEATING	МО				2) DD CORR.	FACTOR F	UEL TYPE		CAPACITY	
PART LOAD I POINTS (R)	1 1.6	3 4	5 6 7	8 9		EFFICIENCY	0.69.0.6	3 4	5 6 7	8 9 10 11
COOLING	MO	NTH ON LOO	(1) MONTH	1	2) (i)	F	UEL TYPE	EQP1	r. Capacity $arphi$ (r	∠ 2 MIN
PART LOAD POINTS	2	3 4	5 6 7	8 9		EFFICIENC' POINTS			5 6 7	8 9 10 11
BIN Nº HEATING	BEGI	(I)	BIN Nº COC	DLING BEG	INS (I)	HEAT NON	-WORK HO		Y	-WORK HOURS?
CONDUCTION	ON		HS ZONE ?						RAD DISK F	
		NOR1	ГН	Ε.	WA AST	LLS SOUTI	4	WE	ST	ROOF
AREA	(R)	76	7.0	ife	468.0	767	7.0	440	92.0	9,132.0
U-VALUE COLOR ADJUS	(R)	0.2			,24	0,2		0.:		0.069
FACTOR	(R)	0.6		0	0.65	0.	65	0.6	-	0.8
CLTD EXTERNAL SH		4			1.0	4		4	, , , , , , , , , , , , , , , , , , , ,	Φ ()
FACTOR ATTIC	(R) VENT	LATION ?	9	PERCENT	POSSIBLE SI	JMMER SUNS			OSSIBLE WI	NTER SUNSHINE
Y		(N)			SS (VERTICA	(L)	(R)	J		SKYLIGHT or ROOF
AREA	(R)	N 352.0	NE_	824.0	SE_	s 332.0	SW	800.0	NW	GLASS
U-FACTOR	(R)	0.568		0.568		0.568		0.568		
SHADING COEFFICIENT	(R)	1.0		1.0		1.0		1.0		
FACTOR) (R)	11.53		5.47		6.43		5.47		
MAX SHGF, SUMMER	(1)	38		216		109		216		
MAX SHGF, WINTER EXTERNAL SH	(I)	20		154		254		154		
FACTOR O: NONE	(R)	FLOOR ARE	A (2) FLC	VOR U-VALI	UE CRAWL S	PACE TEMP		1 -	OSED PERIA	METER LENGTH
TYPE 2 CRAW	<u>Þ '</u> 	9132.0	DESIGN D	AY TEMPE		SPACE HE		PERATURE R		I) LING TEMPERATURE (
30 (I		ELEVATION	s 91.0	FLOW RAT	-3.0	D 78.0	HEATIN	78.0 IG AIR TEMP	(R) COC	DUNG AIR TEMP (R
INTERNAL		UN THIS ZO	ONE ? Nº of	TYPES?	FM(R) /70 (INTE	RNAL GAIN			(4) PEOPLE (5
GAINS	FUEL			(1)	3	/	J (E) AP		/	
DAY:	втин.	/ UNIT		29	18067.	0 3020	0.0		300,	
•	NUMBE	R OF UNITS	S	(1)	1	/			1	0
		LOAD FACT		(R)	0.001	1.0			1.0	1.0
MICHT:	SCHED		CTION FACT	OR (R)	1.0		0.0		300	
NIGHT:		ER OF UNIT	S	(1)	18067.0	302	9.0		300.	.0 255.0
	SPACE	E LOAD FAC	CTOR	(R)	0,001	1.0)		1.0	1.0
	SCHE	DULE CORR	ECTION FAC	TOR (R)	0.1	0.4	14		0,4	4 1.0
	EFFI	CIENCY		(R)	68.86	100	0		100.	0
INPUT FILE	XXXX	XX.IN)	6230-I	EN		OUTP	UT FILE	(XXXXXX.R	PT) 62	30.RPT

BUILDING--S-6230 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN

*****	BIN HEATING	AND COOLING	*****
*****	LOADS	REPORT	*****
*****	BUILDING	BOUNDARY	*****

ві	N		URS		MECH HEATING LOADS		ING LOADS
F	İ	7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
				MBTU	MBTU	MBTU	MBTU
-25 t	0 -20	0	0	.0000	.0000	.0000	.0000
	o -15	0	. 0	.0000	.0000	.0000	.0000
	0 -10	0	0	.0000	.0000	.0000	.0000
	0 -5	Ö	2	.0000	1.1637	.0000	.0000
	.0 0	Ö	8	.0000	4.4128	.0000	.0000
	.0 5	15	94	6.1521	48.9540	.0000	.0000
	o 10	17	121	6.4403	59.5400	.0000	.0000
	.0 15	37	168	12.8780	77.8500	.0000	.0000
	o 20	55	303	17.4320	131.3400	.0000	.0000
	o 25	97	376	27.7600	151.7100	.0000	.0000
	o 30	112	486	28.3570	181.1500	.0000	.0000
	o 35		353	20.8770	120.9300	.0000	.0000
	0 40		407	27.4310	126.2400	.0000	.0000
	o 45	135	493	21.2100	131.0700	.0000	.0000
45 t	o 50	181	594	21.6960	132.7700	.0000	.0000
50 t	o 55	175	556	14.6070	96.7510	.0000	.0000
55 t	o 60	178	563	9.6926	64.2090	.0000	.0000
60 t	o 65	192	621	.0000	.0000	.0000	.0000
65 t	o 70	210	521	.0000	.0000	.0000	.0000
70 t	o 75	193	327	.0000	.0000	.0000	.0000
75 t	o 80	192	220	.0000	.0000	.0000	.0000
80 t	o 85	163	114	.0000	.0000	.0000	.0000
85 t	o 90	135	74	.0000	.0000	.0000	.0000
90 t	o 95	15	19	.0000	.0000	.0000	.0000
95 t	o 100	0	0	.0000	.0000	.0000	.0000
100 t	0 105	0	0	.0000	.0000	.0000	.0000
AN	IN	2340	6420	214.5312	1328.1040	.0000	.0000

BUILDING--S-6230 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN ZONE # 1 CASE #0

*****	MONTHLY HEATING AND COOLING	******
******	LOADS REPORT	******
*****	BUILDING BOUNDARY	******

MONTH	MECH HEAT	ING LOADS	MECH COOLI	MECH COOLING LOADS		
	7 - 16	17 - 6	7 - 16	17 - 6		
	MBTU	MBTU	MBTU	MBTU		
01 JAN	43.6420	216.0000	.0000	.0000		
02 FEB	39.3340	192.4500	.0000	.0000		
03 MAR	29.4510	177.9500	.0000	.0000		
04 APR	16.2510	120.7000	.0000	.0000		
05 MAY	6.8428	85.6030	.0000	.0000		
06 JUN	.0000	.0000	.0000	.0000		
07 JUL	.0000	.0000	.0000	.0000		
08 AUG	.0000	.0000	.0000	.0000		
09 SEP	2.7853	60.9430	.0000	.0000		
10 OCT	6.5042	115.8000	.0000	.0000		
11 NOV	36.8000	175.3500	.0000	.0000		
12 DEC	32.9210	183.3200	.0000	.0000		
ANN	214.5312	1328.1040	.0000	.0000		

Building Boundary Energy per Square Foot of Total Building area = 71917.7 BTU

BUILDING--S-6230 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN

*****	BIN SOLAR ENERGY REPORT	******
*****	DIRECT GAIN THROUGH	******
******	WINDOWS AND SKYLIGHTS	******

BIN F	HOURS 7-16	SOLAR DIRECT GAIN 7 - 16 MBTU
-25 to -20 -20 to -15 -15 to -10 -10 to -5 -5 to 0 0 to 5 5 to 10 10 to 15 15 to 20 20 to 25 25 to 30 30 to 35 35 to 40 40 to 45 45 to 50 50 to 55 55 to 60 60 to 65 65 to 70 70 to 75 75 to 80 80 to 85 85 to 90	0 0 0 0 15 17 37 55 97 112 94 144 135 181 175 178 192 210 193 192 163 135	.0000 .0000 .0000 .0000 .0000 1.9163 2.2020 4.8584 7.3197 13.0819 15.3040 13.0116 20.1888 19.1671 26.0201 25.4688 26.2220 28.6258 31.6830 29.4614 29.6503 25.4618 21.3281
90 to 95 95 to 100 100 to 105	15 0 0	2.3965 .0000 .0000
ANN	2340	343.3675

BUILDING--S-6230 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN

*****	MONTHLY	INTE	ERNAI	GAINS	REPORT:	*****
******	LOADS	AND	RAW	SOURCE	ENERGY	*****
******		CC	ONSU	IPTION		*****

MONTH	DHW NAT GAS MBTU	LIGHTS ELEC MBTU	MISC ELEC MBTU	PEOPLE MBTU
01 J	4.4174	.7375	.0733	8.4915
02 F	4.1410	.6538	.0649	7.5276
03 M	4.7101	.7136	.0709	8.2161
04 A	4.3740	.7056	.0701	8.1243
05 M	4.5637	.7255	.0721	8.3538
06 J	4.5204	.6936	.0689	7.9866
07 J	4.4174	.7375	.0733	8.4915
08 A	4.7101	.7136	.0709	8.2161
09 S	4.5204	.6936	.0689	7.9866
10 O	4.4174	.7375	.0733	8.4915
11 N	4.5204	.6936	.0689	7.9866
12 D	4.5637	.7255	.0721	8.3538
TOT	53.8758	8.5309	.8474	98.2260
RAW SOURCE	78.2396	28.9945	2.8803	98.2260

BUILDING--S-6230 CASE--BASELINE DATE--6/28/93 PREPARED BY--AJN ALL ZONES CASE #0

*****	MONTHLY HEATING	AND COOLING	******
******	RAW SOURCE	ENERGY	******
******	CONSUMPTION	REPORT	*****

MONTH		AL HEATING NAT GAS	TOTAL COOLING		
		MBTU	M	BTU	
					
01 J		377.3842		.0000	
02 F		336.9019		.0000	
03 M		301.4541		.0000	
04 A		199.0493		.0000	
05 M		134.3686		.0000	
06 J		.0000		.0000	
07 J		.0000		.0000	
08 A		.0000		.0000	
09 S	•	92.6276		.0000	
10 O		177.7608		.0000	
11 N		308.3561		.0000	
12 D		314.2997		.0000	
ANN		2242.2020		.0000	
BTU/SF/YR	HEATING:	104531.6	COOLING:	.0	

Raw Source Energy per Square Foot of Total Building Area = 104531.6 BTU

EMC EN	SINE	ERS	S. IN	IC.			B	CE	P	- 11	4P	UT	F	OF	₹N	1		DEN	IVER	. (COLO	ORAE	00 -	
CASE TYPE		EXIS	TING IN	PUT F			XXXX.	(NI			T		•		TE	N CHA				-		XX.XX		
NEW EXISTING	(D)		623		I19	1	,				\perp	122.0			\perp							/	****	,
PROJECT D	ESCRIP	TION) (20 Ci	HARD						-		(20 C			\$. [CASE	or E	:CM #			E (mm		
PREPARED BY		6 C	BUILD	NO PAK	NAME:		(60			FLO			(R)			ONES	(1)		E NUA	(T.	FAN (STEN	,	Y
HEATING	M	ONTI	H ON (O	D-12)	MON	тн о	FF (O		DD	CORR	. FAC		FUE	EL TY	PE		EQF	T. C.	APACI		# P/	ART LO	21	MIN
PART LOAD I	2	3	. 4	5	6	7	8	9	10	li .		(R) FICIEN XNTS	CY (R)	I	2	3	4	5	6	(R)	8	9	_	II
COOLING	M	TINC	H ON (O	0-12) (1)	1	тно	FF (0)	(1)		1		,	FU	EL TY	PE	(i)	EQF	T. C	APACI"	TY (R)	# P/	ART L	2 N	
PART LOAD POINTS	2	3	4	5	·	7	8	9	Ю	11		FICIEN	VCY	1	2	3	4	5	6	7	8	9	_	11
BIN Nº HEATIN	IG BEG	INS	(1)	BIN	N ₅ C	00LI	NG BE	EGINS	3	(1)	i	EAT N	0N-1		HOI N	URS ?		co	OL N		VORK N	HOUR:	5?	
CONDUCT	ION			HIS Z	ONE ?	?	T									S	OLAF	RA	D DIS	K FIL	£٠			
		T	NOR	тн				EAS	T .	W	ALLS		JTH				w	EST				ROOF		
AREA	(R)	1				T					T													
U-VALUE	(R)	T	,			T			-		T	•												
COLOR ADJUS	STMEN' (R)					I	-				I													
CLTD	(1)					\perp					\perp											_ ,		
EXTERNAL S FACTOR	HADE (R)														,							<u>-</u>		
	VEN	TILA'	TION ?			P	ERCE	NT P	ossi	BLE S	MUS	MER SU	NSH		(R)	PERC	ENT	POS	SIBLE	WINT	TER S	UNSHI	NE	(R)
-1			N		NE		- Gi	LASS	S (VI	ERTIC	:AL)	s		sw		w)		NW	S	KYLI	GHT o		OF
AREA	(R	7		Π		T					T													
U-FACTOR	(R	1		Т		T					T								-					
SHADING COEFFICIENT	(R					I					I													
COOLING LOA FACTOR	D (R																							
MAX SHGF, SUMMER	(1)																							
MAX SHGF, WINTER	. (1)			<u>l</u>		\perp					L													
EXTERNAL SE FACTOR	(R	5									$oldsymbol{\perp}$													
FLOOR O NON TYPE 2 CRA	M. 1) FL	OOR ARE	A (R)		LOOF	₹ U-W	ALUE (R)	1	AWL	SPA	CE TE	MPE W	RATU	RE	(R)		OSE	D PE	RIME	TER	LENG	ГН	(R)
TEMP RANGE	, ·			s			įV	N			D	PACE H		18	1 7	70.0		D			1	1		RE (R)
CONVECTI			EVATIO					ACFM		CCUP/	UNC	ACF	M(R)	D	70	AIR O [N 7				NG A	IR TEI	AP	(K)
INTERNAL GAINS			THIS Z	ONE	? Nº (of T	()	1)	Dł	1W ((1)		HTS			AYT S		3)	MIS	C.	(4)	PEO	PLE	(5)
DAY:	FUEL						(I) (R	+			\dashv				\vdash			+				_	\leq	
DAY			OF UNIT				(1)				十			-	\vdash			+			-			-
			AD FAC				(R	工			1							工						
			E CORRI	ECTIC	N FAC	TOR		-			\bot							4			-]
NIGHT:	BTUH						(R)				4				-			+						_
			OF UNIT				(1) (R				\dashv				├			+						$-\!\!\!\!-\!$
			E CORF			сто				~~~	十				十			+			\dashv			
	EFF						(R	1			丁											\geq	\leq	\leq
INDUT EU E	1000	,	1813		2^		$\overline{}$					OU	rein	r Ell I	= (XXXX	YY F	PPT	<i>i</i> -	771	\ Q	10		$\overline{}$

BUILDING--S-6230 ZONE # 1 CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

*****	BIN HEATING AND COOLIN	G ************
*****	LOADS REPORT	**********
*****	BUILDING BOUNDARY	**********

BIN		HOURS		MECH HEAT		MECH COOLING LOADS		
	F		7-16	17- 6	7 - 16	17 - 6	7 - 16	17 - 6
					MBTU	MBTU	MBTU	MBTU
-25	+-	-20	0	0	.0000	.0000	.0000	.0000
-20		-15	0	0	.0000	.0000	.0000	.0000
-15	to	-10	0	0	.0000	.0000	.0000	.0000
		-10 -5	0	2	.0000	1.0087	.0000	.0000
-10 -5	to		0	8	.0000	3.7930	.0000	.0000
_	to	0 5	15	94	4.9900	41.6720	.0000	.0000
0 5	to	10	13 17	121	5.1231	50.1660	.0000	.0000
_	to	15	37	168	10.0110	64.8340	.0000	.0000
10	to		57 55	303	13.1700	107.8700	.0000	.0000
15	to	20	97	303 376	20.2450	122.5800	.0000	.0000
20	to	25	_	486	19.6810	143.5000	.0000	.0000
25	to	30	112		13.5940	93.5850	.0000	.0000
30	to	35	94	353		94.9410	.0000	.0000
35	to	40	144	407	16.2740		.0000	.0000
40	to	45	135	493	10.7500	94.8850		.0000
45	to	50	181	594	8.2917	91.7110	.0000	
50	to	55	175	556	2.3649	62.6610	.0000	.0000
55	,to	60	178	563	.0000	38.0230	.0000	.0000
60	to	65	192	621	.0000	.0000	.0000	.0000
65	to	70	210	521	.0000	.0000	.0000	.0000
70	to	75	193	327	.0000	.0000	.0000	.0000
75	to	80	192	220	.0000	.0000	.0000	.0000
80	to	85	163	114	.0000	.0000	.0000	.0000
85	to	90	135	74	.0000	.0000	.0000	.0000
90	to	95	15	19	.0000	.0000	.0000	.0000
95	to	100	0	0	.0000	.0000	.0000	.0000
100	to	105	0	0	.0000	.0000	.0000	.0000
	ANN		2340	6420	124.4945	1011.2250	.0000	.0000

BUILDING--S-6230 ZONE # 1 CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

*****	MONTHLY HEATING AND COOLING	******
*****	LOADS REPORT	******
*****	BUILDING BOUNDARY	******

MONTH		MECH HEAT	ING LOADS	MECH COOLIN	MECH COOLING LOADS		
		7 - 16	17 - 6	7 - 16	17 - 6		
		MBTU	MBTU	MBTU	MBTU		
-	01 JAN	28.9990	173.0000	.0000	.0000		
	02 FEB	25.5480	154.3300	.0000	.0000		
	03 MAR	16.1150	137.5800	.0000	.0000		
	04 APR	7.2109	86.6830	.0000	.0000		
	05 MAY	1.4547	57.3240	.0000	.0000		
	06 JUN	.0000	.0000	.0000	.0000		
	07 JUL	.0000	.0000	.0000	.0000		
	08 AUG	.0000	.0000	.0000	.0000		
	09 SEP	.4890	40.1790	.0000	.0000		
	10 OCT	2.0481	82.4800	.0000	.0000		
	11 NOV	23.1350	136.2200	.0000	.0000		
	12 DEC	19.4950	143.4200	.0000	.0000		
	ANN	124.4945	1011.2250	.0000	.0000		

Building Boundary Energy per Square Foot of Total Building area = 52947.3 BTU

BUILDING--S-6230 ZONE # 1 CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

*****	BIN SOLAR ENERGY REPORT	*****
*****	DIRECT GAIN THROUGH	******
*****	WINDOWS AND SKYLIGHTS	*****

BIN F	HOUF 7 – 1		
-10 to -5 to 0 to 5 to 10 to 20 to 25 to 30 to 40 to 50 to 55 to 60 to 70 to 75 to 80 to 90 to	15 10 -5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 00	94 13.0116 14 20.1888 35 19.1671 31 26.0201 75 25.4688 78 26.2220 92 28.6258 10 31.6830	_
100 to 1			

BUILDING--S-6230 ZONE # 1 CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

******	MONTHLY	INT	ERNAI	GAINS	REPORT:	******
******	LOADS	AND	RAW	SOURCE	ENERGY	******
******		C	ONSU	IPTION		******

MONTH	DHW	LIGHTS	MISC	PEOPLE
	NAT GAS	ELEC	ELEC	
	MBTU	MBTU	MBTU	MBTU
01 J	4.4174	.7375	.0733	8.4915
02 F	4.1410	.6538	.0649	7.5276
03 M	4.7101	.7136	.0709	8.2161
04 A	4.3740	.7056	.0701	8.1243
05 M	4.5637	.7255	.0721	8.3538
06 J	4.5204	.6936	.0689	7.9866
07 J	4.4174	.7375	.0733	8.4915
08 A	4.7101	.7136	.0709	8.2161
09 S	4.5204	.6936	.0689	7.9866
10 O	4.4174	.7375	.0733	8.4915
11 N	4.5204	.6936	.0689	7.9866
12 D	4.5637	.7255	.0721	8.3538
TOT	53.8758	8.5309	.8474	98.2260
RAW SOURCE	78.2396	28.9945	2.8803	98.2260

BUILDING--S-6230 ALL ZONES CASE--ECO #19 - RADIATOR CONTROLS CASE #1 DATE--4/8/93 PREPARED BY--AJN

*****	MONTHLY HEATING	AND COOLING	******
*****	RAW SOURCE	ENERGY	******
*****	CONSUMPTION	REPORT	******

MONTH	TO	TAL HEATING NAT GAS	TOT	AL COOLING
		MBTU		MBTU
01 J		293.6041		.0000
02 F		261.4554		.0000
03 M		223.3972		.0000
04 A		136.4743		.0000
05 M		85.4338		.0000
06 J		.0000		.0000
07 J		.0000		.0000
08 A		.0000		.0000
09 S		59.1106		.0000
10 O		122.8604		.0000
11 N		231.6279		.0000
12 D		236.7909		.0000
ANN		1650.7550		.0000
BTU/SF/YR	HEATING:	76958.3	COOLING:	.0

Raw Source Energy per Square Foot of Total Building Area = 76958.3 BTU

DANFOSS RA... the simplified combination design makes ordering easier than ever.

Combination hot water/low-pressure steam Danfoss RA thermostatic radiator valves make specifying, ordering, stocking, and installation easy. You need only stock quantities of eight different valves, plus the appropriate accessories, parts, and tools shown below.

Screwdriver for above

In addition, RA combination valves may be used interchangeably with a variety of dial/operator/ sensor models.

The chart below gives you an overview of the entire RA line. If you have a specific question, feel free to call your Danfoss representative for assistance.

948U2103

\$54.15 MPD Co., Denver, CO. (303) 322-0169 DAVID PETTIT (4-8-93) Operators Operators For use on hot water (mex.: 250°F) and Cap. tube lengths and with the second 6' 28 6' armored 3' + 3' ipe LPS (max: 15 psig) 4 Connection: Configuration -FPT x MPT 013-7101 013-7002 1/2" NPT 013-7151 2.75 3/4" NPT 2.75 013-7153 1"NPT 5.15 a Buck to a 013-7155 11/4" NPT 5.15 013-7157 1/2" NPT 2.75 013-7152 3/4" NPT 2.75 013-7154 1" NPT 5.15 013-7156 11/4" NPT 5.15 013-7158 Parts and accessories 1/2" universal valve repair kit 013-7172 3/4" universal valve repair kit 013-7173 1" universal valve repair kit 013-7174 11/4" universal valve repair kit 013-7175 1/2" steam strainer 013-7242 3/4" steam strainer 013-7243 1" steam strainer 013-7244 11/4" steam strainer 013-7245 Gasket 013-7045 1" and 114" stem retainer 013-7046 **◎** 1/2" and 3/4" valve repair tool 013-7047 900000000000 Sensor guard 0 Tamper kit (repairs dial and knob) 013-7064 **(4)** 681X2902 Tamper screw for selector knob _11=

C4-45

TAB C-5 ECO SUMMARY

LIFE CYCLE COST ANALYSIS SUMMARY ENERGY CONSERVATION INVESTMENT PROGRAM (ECIP)

						•	
	LOCATION: F	FORT CARSON, CO	LORADO	REGION:	4	PROJECT NO:	
	PROJECT TITLE	: FT CARSON E	EAP UPDATE			FISCAL YEAR:	1992
	DISCRETE POR	TION NAME:	ECOs 13, 14, 16,	and 19			
	ANALYSIS DATE	: 07/01/93		ECONOMIC LIFE	:: 20	PREPARED BY:	A. NIEMEYER
1 IN	VESTMENT COST	s					
A.	CONSTRUCTION	COST	=			\$332,813	
В.	SIOH COST		(5.5% of 1A) =			\$18,305	
C.	DESIGN COST		(6.0% of 1A) =			\$19,969	
D.	TOTAL COST		(1A + 1B + 1C) =			\$371,086	
E.	SALVAGE VALUE		=			\$0	
F.	SALVAGE VALUE	OF EXISTING EQUIP.	=			\$0	
G.	TOTAL INVESTME	NT	(1D - 1E - 1F) =			>	\$371,086
2 EN	NERGY SAVINGS	(+) or COST (-)					
		73-X USED FOR DISCO	OUNT FACTORS: C	CTOBER 1992			
	ENERGY	COST	SAVINGS	ANNUAL \$	DISCOUNT	DISCOUNTED	
	SOURCE	\$/MBTU (1)	MBTU/YR (2)	SAVINGS (3)	FACTOR (4)	SAVINGS (5)	
A.	ELEC	\$7.32	867.91	\$6,357	14.53	\$92,373	
В.	DIST			\$0	17.63	\$0	
C.	NAT GAS	\$3.48	12813.48	\$44,540	18,59	\$827,992	
D.	COAL			\$0	14.46	\$0	1
E.	SOLAR			\$0		\$0	
F.	DEMAND SAVINGS	\$69.68 / year		\$2,747	13.59	\$37,338	
G.	TOTAL		13681.39	53,644.5		>	\$957,703
3 NO	ONENERGY SAVIN	NGS (+) or COST (-)					
A.	ANNUAL RECURR	ING				\$0	
	1 DISCOUNT FAC	TOR		(From Table A-2) =	13.59		,
	2 DISCOUNTED S	AVINGS or COST		(3A x 3A1) =		\$0	*
В.	NONRECURRING						
	ITEM		SAVINGS or	YEAR OF	DISCOUNT	DISCOUNTED	
				OCCURRENCE (2)		SVGS or COST (4)	
	a. 141 Standard M	otors (1/2 to 40 HP)	\$69,964	• •			
	b.	,	\$0	0			
	c.		\$0	0	0.00		
	d TOTAL		\$69,964			\$57,370	ı
C.	TOTAL NONENER	GY DISCOUNTED SAVI	INGS or COST		(3A2 + 3Bd4) =		\$57,370
4 SI	MPLE PAYBACK (SPB) - (YRS)		1G/((2G3 + 3A + (3Bd1/20)) =		6.5
	OTAL NET DISCOL				(2G5 + 3C) =		\$1,015,074
6 SA	VINGS-TO-INVES	TMENT RATIO (SIR))		(5/1G) =		2.74
		AL RATE OF RETUR		[(1+ 04) x SIR to	1/20 power - 1] x 100 =		9.37
			(* 11) = (/0)	[[11:04] X OII1 10	"=a bound a 11 v 100 =		3.31

APPENDIX D

BACKUP DATA, HEATING AND COOLING EQUIPMENT DISCREPANCIES AND BUILDING SURVEY FORMS

TAB 1 HEATING AND COOLING EQUIPMENT DISCREPANCIES

CONSTRUCTION COST ESTIMATE		-	DATE PREPARED					
			7-Apr-93			SHEET	OF	
Project					T	OR ESTIMATE		
UPDATE EXISTING EEAP								
Location					x	Code A (No	design completed)	
FORT CARSON, COLORADO								
Architect-Engineer				Code B (Preliminary design) Code C (Final design)				
E M C ENGINEERS, INC., 2750 S. WADSWORT	HRIVD	DEN/	FR CO	R0227	-	Other (Speci		
Drawing No.		Estima		WEE!	Chacked I		<u> </u>	
January 10.		John Mekis			Checked I	•		
	Ouen		HEKIS	Labor	T. FORSTER			
CHAMADY		Quantity		Labor	Material Bos			
SUMMARY	No.	Unit	Per	Total	Per		Total	
	Units	Meas.	Unit	Total	Unit	Total	Cost	
GROUP 1: BARRACKS - "A"	ļ			1 700 00		7.004.40		
GROUP 2: BARRACKS - "B"	 			1,720.30		7,824.43	9,544.74	
GROUP 3: DISPENSARY		-		10,512.88		88,111.58	98,624.46	
GROUP 4: 3 CO. HQ.	<u> </u>	 		955.72		6,385.11	7,340.82	
GROUP 5: DENTAL CLINIC, BLDG P 1227		-		11,506.95		60,834.15		
GROUP 6: INDOOR POOL, BLDG 1446				477.86		3,192.55	3,670.41	
GROUP 7: COMMUNITY CENTER				707.23		7,585.46	8,292.69	
GROUP 8: MAIN LIBRARY, BLDG 1528				764.57		4,686.52	5,451.09	
GROUP 9: DENTAL CLINIC, BLDG 1855				0.00		0.00	0.00	
GROUP 10: COOLING PLANT, BLDG 1864				1,013.06 1,032.18		6,401.08	7,414.14	
GROUP 11: DAY ROOM & ADMIN.				1,720.27		10,869.41	11,901.58	
GROUP 12: CO ADMIN & SUPPLY				3,440.54		10,622.97	12,343.24	
GROUP 13: BN ADMIN & CLRM				2,484.85		15,337.43 13,814.17	18,777.97	
GROUP 14: GYM				2,370.18		15,547.48	16,299.02 17,917.66	
GROUP 15: UNIT CAHPEL				1,108.63		8,682.21	9,790.84	
GROUP 16: CONS. FLD MNT SHOP				1,318.89		9,810.84	11,129.73	
GROUP 17: D/S ORG. MAINT				592.55		3,274.08	3,866.63	
GROUP 18: DS MAINT SHOP				745.46		4,784.08	5,529.54	
				1 10.70		4,704.00	0,020.04	
TOTALS:				42,472.12		277,763.54	320,235.66	
							**	
			.,					
			-					
ENG FORM 150					•	U.S. GOVERNMENT	PRINTING OFFICE 1959 0-516148	

PREVIOUS EDITION MAY BE USED

Project UPDATE EXISTING EEAP Location				7-Apr-93	BASIS FO	SHEET	OF	
UPDATE EXISTING EEAP								
Location]			
					x	Code A (No d	lesign completed)	
FORT CARSON, COLORADO							iminary design)	
Architect-Engineer				Code C (Final design)				
EMC ENGINEERS, INC., 2750 S. WADSWOR	TH BLV	D., DENV	ER. CO 8	30227	_	Other (Specif	- .	
Drawing No.		Estima			Checked b		y/	
		John Mekis			T. FORSTER			
	Quantity Labor			Material				
GROUP 1: BARRACKS - "A"	No. Unit		Per					
,	Units	Meas.	Unit	Total	Per Unit	Total	Total	
Valve 2-Way, 1/2", with electric/electronic actuator	1	EA	45.62		197.00	197.00	Cost	
Valve 2-Way, 1/2", with electric/electronic actuator	1	EA	45.62	45.62	197.00	197.00	242.6	
New Pneumatic Damper Actuator	1	EA	34.22	34.22			242.6	
Valve 3-Way, 2", with electric/electronic actuator	1	EA	79.84	79.84	186.00 435.00	186.00	220.2	
	 	 ` 	13.04	13.04	405.00	435.00	514.8	
SUBTOTAL @ BUILDING	 			205.00				
	-			205.30		1,015.00	1,220.3	
	1	 						
BUILDINGS:	 	 		205.20				
P 1950	 			205.30 205.30		1,015.00	1,220.3	
P 2070		-		205.30		1,015.00	1,220.30	
P 2153		 				1,015.00	1,220.30	
P 2250				205.30		1,015.00	1,220.30	
				205.30		1,015.00	1,220.30	
	 							
						·		
		$\neg +$						
								
								
SUBTOTAL		v Suo Marini 198 (in	V	1,026.50	San Maj	F 075 00		
VORKERS COMP INSURANCE	8.7%			89.31		5,075.00	6,101.50	
SUBTOTAL	3.776		A STATE OF THE STA	1,115.81	72			
OVERHEAD & BOND	16.8%	2		187.46	Marian Caraca Ca	5,075.00	6,190.81	
SUBTOTAL	أحصد			1,303.26		852.60	1,040.06	
ROFIT	10.0%	Branch I		130.33	- 4-3	5,927.60	7,230.86	
SUBTOTAL	10.070	*****		1,433.59	77	592.76	723.09	
ONTINGENCY	20.0%			286.72		6,520.36	7,953.95	
TOTAL ESTIMATED COST	2010/0	. . .	4	1,720.30	- 1	1,304.07	1,590.79	
				1,720.30		7,824.43	9,544.74	
The state of the s		$\neg +$			 -			
								
								
								
								
NG FORM 150								
NUG 59		PA	REVIOUS EDITIO	ON MAY BE USED		. GOVERNMENT PAT	NTING OFFICE 1959 0-516148	

CONSTRUCTION COST ESTIMATE				DATE PREPARED				
7-Apr-9					3	SHEET	OF	
Project				BASIS FOR ESTIMATE				
UPDATE EXISTING EEAP								
Location					X Code A (No design completed)			
FORT CARSON, COLORADO					Code B (Preliminary design)			
Architect-Engineer					_	Code C (Fina	al design)	
E M C ENGINEERS, INC., 2750 S. WADSWORT	TH BLV)., DEN\	/ER, CO	80227		Other (Speci		
Drawing No.			ator		Checked by			
		John i	lekis		T. FORS	TER		
GROUP 2: BARRACKS - "B"	Quantity Labor		Labor	Material				
	No.	Unit	Per		Per		Total	
Volvo 2 Woy, 48 with all at 1/4	Units		Unit	Total	Unit	Total	Cost	
Valve 2-Way, 1", with electric/electronic actuator	1	EA	45.62		252.00	252.00	297.	
Valve 2-Way, 1-1/2", with electric/electronic actuator Valve 3-Way, 2-1/2", with electric/electronic actuator	2	EA	57.03		342.00	684.00	798.	
vaive 5-vvay, 2-1/2 , with electric/electronic actuator	1	EA	91.24	91.24	1,350.00	1,350.00	1,441.	
SUBTOTAL @ BUILDING	<u> </u>	-						
BUILDINGS:		-		250.92		2,286.00	2,536.	
P 1951,1952,1953,1954	4		250.92	1,003.68	2,286.00	04445		
			230.92	1,003.66	2,286.00	9,144.00	10,147.	
P 2050,2051,2052,2054	4		250.92	1,003.68	2,286.00	9.144.00	40447	
				1,000.00	2,200.00	9,144.00	10,147.	
P 2071,2072,2073,2074	4		250.92	1,003.68	2,286.00	9,144.00	10.147	
						0,144.00	10,147.	
P 2150,2151,2152,2154	4		250.92	1,003.68	2,286.00	9,144.00	10,147.	
					,		10,147.	
P 2251,2252,2253,2254	4		250.92	1,003.68	2,286.00	9,144.00	10,147.6	
P 2450,2451,2452,2453,2454	5		250.92	1,254.60	2,286.00	11,430.00	12,684.6	
								
	 						· · · · · · · · · · · · · · · · · · ·	
SUBTOTAL		makt man it is	2000 000	6,273.00		57.450.00		
VORKERS COMP INSURANCE	8.7%			545.75	THE RESIDENCE OF THE PARTY OF T	57,150.00	63,423.0	
SUBTOTAL	De la se			6,818.75			a contract of the contract of	
OVERHEAD & BOND	16.8%			1,145.55		57,150.00 9,601.20	63,968.7	
SUBTOTAL	2. 1 12.100es 3 40.		Berradi padati. Republika (North	7,964.30		66,751.20	10,746.7	
PROFIT	10.0%			796.43	22.5	6,675.12	74,715.5 7,471.5	
SUBTOTAL	in the second second second second second second second second second second second second second second second			8,760.73		73,426.32	82,187.0	
CONTINGENCY	20.0%			1,752.15		14,685.26	16,437.4	
TOTAL ESTIMATED COST			ar Sille access Sille	10,512.88		88,111.58	98,624.4	
NG FORM 150					·			
AUG 59					. * U.\$	S. GOVERNMENT PR	INTING OFFICE 1959 0-516148	

CONSTRUCTION COST ESTIMATE			DATE PREPARED						
7-Apr-9					3	SHEET	OF		
Project UPDATE EXISTING EEAP					BASIS FO	R ESTIMATE			
Location					×				
FORT CARSON, COLORADO Architect-Engineer							esign completed)		
							minary design)		
_	THE DIVE		/== aa -		-	Code C (Final			
E M C ENGINEERS, INC., 2750 S. WADSWOR' Drawing No.	IN DLVL			30227		Other (Specif	y)		
orawing ito.		Estimator John Mekis				Checked by			
			T		T. FORSTER				
CPOUR & DICREMO ARY	Quantity			Labor	Material				
GROUP 3: DISPENSARY	No. Units	Unit Meas,	Per Unit	Total	Per Unit	Total	Total		
BUILDING 1007	1	Mouse	Oille	Iotai	Ont	IOTAI	Cost		
Valve 2-Way, 1", with electric/electronic actuator	1	EA	45.62	45.62	252.00	252.00	297.62		
New Electric/Electronic Damper Actuator	4	EA	45.62	182.49	356.68	1,426.72	1,609.2		
Valve 3-Way, 1-1/2", with electric/electronic actuator	1	EA	57.03	57.03	392.00	392.00	449.03		
BUILDING 1150									
Valve 2-Way, 1*, with electric/electronic actuator	1	EA	45.62	45.62	252.00	252.00	297.62		
New Electric/Electronic Damper Actuator	4	EA	45.62	182.49	356.68	1,426.72	1,609.21		
Valve 3-Way, 1-1/2", with electric/electronic actuator	1	EA	57.03	57.03	392.00	392.00	449.03		
SUBTOTAL		West de	STATE OF THE STATE	570.27	ings Massife Co.	4,141.44	4,711.71		
NORKERS COMP INSURANCE	8.7%			49.61					
SUBTOTAL	for the second of the second o	Marketing of the party and party		619.89		4,141.44	4,761.33		
OVERHEAD & BOND	16.8%	- 1 A C C C C C C C C C C C C C C C C C C		104.14		695.76	799.90		
SUBTOTAL	Karamaran Language			724.03		4,837.20	5,561.23		
PROFIT	10.0%		a de la companya del companya de la companya del companya de la co	72.40		483.72	556.12		
SUBTOTAL				796.43		5,320.92	6,117.35		
CONTINGENCY	20.0%			159.29		1,064.18	1,223.47		
TOTAL ESTIMATED COST			in heime annihang fri Gelle in Gelle Colores	955.72		6,385.11	7,340.82		
		_							
NG FORM 150					*U.\$. GOVERNMENT PRIM	ITING OFFICE 1959 0-516148		
AUG 59		PR	REVIOUS EDITIO	ON MAY BE USE)				

CONSTRUCTION COST ESTIMATE			DATE P	REPARED			
			ļ	8-Apr-93	3	SHEET	OF
Project					BASIS FO	OR ESTIMATE	
UPDATE EXISTING EEAP							
Location					×	Code A (No.	design completed)
FORT CARSON, COLORADO					_ ^		
Architect-Engineer					1 -		liminary design)
E M C ENGINEERS, INC., 2750 S. WADSWOR	TH BIVI) DEN	IED CO	20007	_	Code C (Fina	• ,
Drawing No.	III DE VI	Estima		50227		Other (Speci	<u>fy)</u>
					Checked t	•	
		John I			T. FORS		
GROUP 4: 3 CO. HQ.	Quar	T		Labor		laterial	
anoor 4. 3 co. ng.	No.	Unit	Per	_	Per	ĺ	Total
N. D. d. D.	Units	+	Unit	Total	Unit	Total	Cost
New Pneumatic Damper Actuator	8	EA	34.22	273.73	186.00	1,488.00	1,761
Valve 3-Way, 2", with pneumatic actuator	1	EA	68.43	68.43	403.40	403.40	471
Valve 3-Way, 1", with pneumatic actuator	1	EA	34.22	34.22	250.00	250.00	284
Valve 2-Way, 2", with pneumatic actuator	1	EA	68.43	68.43	435.00	435.00	- 503
Valve 3-Way, 3/4", with electric/electronic actuator	1	EA	45.62	45.62	242.00	242.00	287
CURTOTAL & PULL PINO		ļ					
SUBTOTAL @ BUILDING				490.44		2,818.40	3,308
BUILDINGS:		<u> </u>					
P 1118	1	EA	490.44		2,818.40	2,818.40	3,308
P 1217	1	EA	490.44	490.44	2,818.40	2,818.40	3,308
P 1218	1	EA	490.44	490.44	2,818.40	2,818.40	3,308
P 1219	1 1	EA	490.44	490.44	2,818.40	2,818.40	3,308
P 1220	1 1	EA	490.44	490.44	2,818.40	2,818.40	3,308
P 1363	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
P 1364 P 1365	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
P 1366	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
P 1367	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
P 1664	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
P 1665	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
P 1666 P 1667	1	EA .	490.44	490.44	2,818.40	2,818.40	3,308.
P 100/	1	EA	490.44	490.44	2,818.40	2,818.40	3,308.
CUPTOTAL	Kind on the						
SUBTOTAL SUBTOTAL WORKERS COMP INSURANCE	0.70/	ACCIDITY.		6,866.16		39,457.60	46,323.
	8.7%			597.36			
SUBTOTAL OVERHEAD & BOND				7,463.52		39,457.60	46,921.
SUBTOTAL	16.8%	We have been a second of		1,253.87		6,628.88	7,882.
PROFIT	10.0%			8,717.39		46,086.48	54,803.
SUBTOTAL	70.076			871.74		4,608.65	5,480.
CONTINGENCY	20.0%	Charles		9,589.13		50,695.12	60,284.2
TOTAL ESTIMATED COST				1,917.83 11,506.95		10,139.02	12,056.1
	S. COLON C.	inde,		11,500.95		60,834.15	72,341.1
							
							
							
			1				

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED			
			<u> </u>	7-Apr-93		SHEET	OF
Project					BASIS FO	R ESTIMATE	
UPDATE EXISTING EEAP							
Location					x	Code A (No	design completed)
FORT CARSON, COLORADO					_	Code B (Pre	liminary design)
Architect-Engineer					<u> </u>	Code C (Fina	al design)
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVD)., DEN\	/ER, CO 8	0227		Other (Speci	lfy)
Drawing No.		Estima	tor		Checked b	у	
		John N	lekis .		T. FORS	TER	
	Quan	tity		Labor	М	aterial	
GROUP 5: DENTAL CLINIC, BLDG P 1227	No.	Unit	Per		Per		Total
	Units	Meas.	Unit	Total	Unit	Total	Cost
BUILDING P1227							
Valve 2-Way, 1", with electric/electronic actuator	1	EA	45.62	45.62	252.00	252.00	297.62
New Electric/Electronic Damper Actuator	4	EΑ	45.62	182.49	356.68	1,426.72	1,609.21
Valve 3-Way, 1-1/2", with electric/electronic actuator	1	EA	57.03	57.03	392.00	392.00	449.03
	<u> </u>						
	<u> </u>						
		\vdash					
SUBTOTAL	sila saloud Nicina	1	Zasti u	005.14	3.		
WORKERS COMP INSURANCE	8.7%			285.14		2,070.72	2,355.86
SUBTOTAL				24.81		0.070.70	
OVERHEAD & BOND	16.8%	2.5	2.00	309.94		2,070.72	2,380.66
SUBTOTAL				52.07 362.01		347.88	399.95
PROFIT	10.0%			36.20		2,418.60	2,780.62
SUBTOTAL		200		398.22		241.86 2,660.46	278.06
CONTINGENCY	20.0%			79.64		532.09	3,058.68
TOTAL ESTIMATED COST		part Sept		477.86		3,192.55	611.74 3,670.41
	80.			777.00		0,102.00	3,070.41
			-				
			- 1				

ENG FORM 150				<u></u>	40	.S. GOVERNMENT	PRINTING OFFICE 1959 0-516148
1 AUG 59			PREVIOUS EDIT	TON MAY BE US!			

CONSTRUCTION COST ESTIMATE			DATE PR	EPAKED					
				7-Apr-93	,	SHEET	OF		
Project					BASIS FOR ESTIMATE				
UPDATE EXISTING EEAP									
Location					х	Code A (No	design completed)		
FORT CARSON, COLORADO					l _	Code B (Pre	liminary design)		
Architect-Engineer						Code C (Fina			
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVC	., DENV	ER, CO 8	0227	_	Other (Speci			
Drawing No.		Estima			Checked b		-1/		
		John M	lekis		T. FORS	· .			
	Quan	tity	Labor			aterial			
GROUP 6: INDOOR POOL, BLDG 1446	No.	Unit	Per		Per	atoriui	Total		
	Units		Unit	Total	Unit	Total	1		
BUILDING 1446	l Cinto	I WOULD.	Oilik	TOTAL	Oill	rotai	Cost .		
55.25.1144									
Valve 2-Way, 4", with pneumatic actuator	1	EA	136.87	136.87	1,325.00	1 205 00	4 404		
Valve 2-Way, 3", with pneumatic actuator	2	EA EA	79.84	159.68	1,075.00	1,325.00			
Valve 2-Way, 1-1/4", with pneumatic actuator	1	EA	45.62	45.62	295.00	2,150.00			
Valve 2-Way, 2-1/2", with pneumatic actuator	1	EA EA	79.84	79.84	1,150.00	295.00	340		
The street of th	 	5	75.04	79.04	1,150.00	1,150.00	1,229		
	 	1-1							
	 								
		-							
	 								
									
		 							
SUBTOTAL	Margin sang	3 × 4		400.00					
WORKERS COMP INSURANCE	MA - 5 - 73			422.00	vekining of a	4,920.00	5,342.		
	8.7%			36.71		Section of the sectio			
SUBTOTAL SUBTOTAL	10.00			458.72		4,920.00	5,378.		
	16.8%			77.06		826.56	903.		
SUBTOTAL				535.78		5,746.56	6,282.		
	10.0%	*442		53.58		574.66	628.		
SUBTOTAL	20.00	Secretarios de la company de l	er gogget seller killer kreise.	589.36		6,321.22	6,910.		
TOTAL ESTIMATED COST	20.0%	A second	ganariya in siyana ayaa o omuumuu ayaa ayaa oo o Saaraa ilka giilkaalayaa	117.87		1,264.24	1,382.		
TOTAL ESTIMATED COST	gary i to the constitution with constitution of the constitution o	gerena i an i anno ga	many of the profession and an extension of	707.23		7,585.46	8,292.		
'		1	1	1	1	1			

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED					
			İ	7-Apr-93	}	SHEET	OF		
Project					BASIS FOR ESTIMATE				
UPDATE EXISTING EEAP					İ				
Location					x	Code A (No	design completed)		
FORT CARSON, COLORADO					l _	•	liminary design)		
Architect-Engineer					1 _	Code C (Fin			
EMC ENGINEERS, INC., 2750 S. WADSWORT	TH BLVD	., DENV	ER, CO 8	0227	<u> </u>	Other (Spec			
Drawing No.		Estima			Checked b				
		John M	lekis		T. FORS	-			
	Quan	tity	1	Labor	м	aterial			
GROUP 7: COMMUNITY CENTER	No.	Unit	Per		Per		Total		
	Units	Meas.	Unit	Total	Unit	Total	Cost		
BUILDING 1526	1								
	†								
New Electric/Electronic Damper Actuator	4	EA	45.62	182.49	356.68	1,426.72	1,609.21		
Valve 3-Way, 1", with electric/electronic actuator	3	EA	45.62	136.87	282.00	846.00			
Valve 3-Way, 2", with electric/electronic actuator	1	ΕA	79.84	79.84	435.00	435.00			
Valve 3-Way, 1-1/4", with electric/electronic actuator	1	EΑ	57.03	57.03	332.00	332.00			
							- 500		
SUBTOTAL WORKERS COMP INSURANCE	*			456,22	2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A 2000 A	3,039.72	3,495.94		
	8.7%			39.69					
SUBTOTAL OVERHEAD & BOND	40.004			495.91		3,039.72	3,535.63		
SUBTOTAL	16.8%			83.31	48.	510.67	593.99		
PROFIT	10.0%			579.22		3,550.39	4,129.62		
SUBTOTAL	10.076			57.92		355.04	412.96		
CONTINGENCY	20.0%			637.15		3,905.43	4,542.58		
TOTAL ESTIMATED COST	20.0%		ementa reales	127.43 764.57		781.09	908.52		
			and make the man	104.57	and the second s	4,686.52	5,451.09		
							71		
							T-11.		
ENG FORM 150				1		S COVERNOON	MINTING OFFICE 1955		
AUG 59		6	REVIALIS ENTI	A		SOTEMBER! P	PRINTING OFFICE 1959 0-516148		

CONSTRUCTION COST ESTIMATE			DATE PI	REPARED			
				7-Apr-93	3	SHEET	OF
Project					BASIS FO	OR ESTIMATE	
UPDATE EXISTING EEAP]		
Location					X	Code A (No	design completed)
FORT CARSON, COLORADO						Code B (Pre	liminary design)
Architect-Engineer					l _	Code C (Fina	al design)
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVD			80227		Other (Spec	ify)
Drawing No.		Estima	tor		Checked I	ру	
		John M	leki s		T. FORS	TER	
	Quan	tity		Labor	N	laterial	
GROUP 8: MAIN LIBRARY, BLDG 1528	No. Units	Unit Meas.	Per	Total	Per	T -4-1	Total
BUILDING 1528	Office	Meas.	Unit	lotai	Unit	Total	Cost
ALL CONTROLS OK	<u> </u>						
				<u> </u>			
				 			
				1			
			-				
SUBTOTAL	2			0.00	iddistritument menses e	0.00	0.00
WORKERS COMP INSURANCE	8.7%			0.00		0.00	
SUBTOTAL			477	0.00		0.00	0.00
OVERHEAD & BOND	16.8%			0.00		0.00	0.00
SUBTOTAL				0.00		0.00	0.00
PROFIT	10.0%	4 (2)	excess	0.00	B 1000	0.00	0.00
SUBTOTAL				0.00		0.00	0.00
CONTINGENCY	20.0%			0.00		0.00	0.00
TOTAL ESTIMATED COST			modernovio.	0.00		0.00	0.00
					-		
ENG FORM 150				• <u>.</u>		J.S. GOVERNMENT I	PRINTING OFFICE 1959 0-516148
1 AUG 59			PREVIOUS EDI	TION MAY BE US			

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED			
				7-Apr-93		SHEET	OF
Project					BASIS FO	R ESTIMATE	
UPDATE EXISTING EEAP							
Location					х	Code A (No	design completed)
FORT CARSON, COLORADO						Code B (Pre	liminary design)
Architect-Engineer						Code C (Fina	al design)
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVC	., DEN\	/ER, CO 8	0227		Other (Speci	fy)
Drawing No.		Estima	itor		Checked b	у	
		John 8	/lekis		T. FORS	TER	
	Quan	tity		Labor	М	aterial	
GROUP 9: DENTAL CLINIC, BLDG 1855	No.	Unit	Per		Per		Total
	Units	Meas.	Unit	Total	Unit	Total	Cost
BUILDING 1855							
Valve 2-Way, 1-1/2", with pneumatic actuator	1	EA	45.62	45.62	310.00	310.00	355.62
Valve 3-Way, 2-1/2", with pneumatic actuator	1	EA	79.84	79.84	1,175.00	1,175.00	1,254.84
New Pneumatic Damper Actuator	10	EA	34.22	342.16	186.00	1,860.00	2,202.16
Valve 3-Way, 2", with pneumatic actuator	2	EA	68.43	136.87	403.40	806.80	943.67
	ļ	<u> </u>					
		ļ				ļ	
	 						
	ļ						
	<u> </u>						
		-					
	200						
			-				
SUBTOTAL		ilian on	 Sesena sen wakun	604.49	Asilianie	4,151.80	4,756.29
WORKERS COMP INSURANCE	8.7%					March Constitution	
SUBTOTAL				657.08	**************************************	4,151.80	4,808.88
OVERHEAD & BOND	16.8%			110.39		697.50	807.89
SUBTOTAL				767.47	30.0	4,849.30	5,616.77
PROFIT	10.0%	####		76.75		484.93	561.68
SUBTOTAL				844.22		5,334.23	6,178.45
CONTINGENCY	20.0%			168.84		1,066.85	1,235.69
TOTAL ESTIMATED COST				1,013.06		6,401.08	7,414.14
			1				
ENG FORM 150					4	J.S. GOVERNMENT	PRINTING OFFICE 1959 0-516148
1 AUG 59			PREVIOUS EDIT	TON MAY BE US	ED		

			7-Apr-93	BASIS FO	SHEET (OF		
	ject							
UPDATE EXISTING EEAP								
		······································		х	Code A (No d	esign completed)		
				l				
TH BLVD)., DENV	ER, CO 8	0227					
	T					<u></u>		
	1				-			
Quan			Labor					
	T -			ı		Total		
1	1 1		Total		Total	Cost		
1			7000		1000			
	 							
3	FΔ	205.30	615.90	2 350 00	7 050 00	7,665.9		
 		200.00	010.00	2,000.00	7,050.001	7,000.8		
+	 					· · · · · · · · · · · · · · · · · · ·		
+								
+	+-							
 	 							
								
+	1							
1	1							
1	1							
1								
1								
1								
			-					
16-3405		Maria - 1859	615.90	Sandining and the	7,050.00	7,665.9		
8.7%			53.58					
	South and the second		669.48	Simononecoustrates person , resp	7,050.00	7,719.4		
16.8%	Substituti	No. 1 in the late of the late	112.47		1,184.40	1,296.8		
S mile i considerações s			781.95		8,234.40	9,016.		
			78.20		823.44	901.		
			860.15		9,057.84	9,917.		
20.0%					1,811.57	1,983.0		
	BANKET C		1,032.18		10,869.41	11,901.		
 								
 								
								
								
 	├							
1								
	Quan No. Units 3 4 8.7% 16.8% 10.0%	Estima John M Quantity No. Unit Units Meas. 3 EA 3 EA 4 EA 4 EA 5 EA 6 EA 6 EA 7 EA 8 E	Estimator John Mekis Quantity No. Unit Per Units Meas. Unit 3 EA 205.30	John Mekis Labor	TH BLVD., DENVER, CO 80227 Estimator	Code B (Prelin Code C (Final Code C (Final Code C (Final Other (Specify John Mekis T. FORSTER) Code C (Final Other (Specify T. FORSTER)		

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED			
				7-Apr-93	ı	SHEET	OF
Project					BASIS FO	R ESTIMATE	
UPDATE EXISTING EEAP							
Location					x	Code A (No	design completed)
FORT CARSON, COLORADO					_	Code B (Prei	lminary design)
Architect-Engineer] _	Code C (Fina	ıl design)
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVD	., DENV	ER, CO 8	0227		Other (Speci	fy)
Drawing No.		Estima	tor		Checked b	y	
		John M	lekis		T. FORS	TER	
	Quan	tity	1	Labor	М	aterial	
GROUP 11: DAY ROOM & ADMIN.	No.	Unit	Per		Per		Total
	Unițs	Meas.	Unit	Total	Unit	Total	Cost
Valve 3-Way, 2", with electric/electronic actuator	1	EA	79.84	79.84	435.00	435.00	514.84
New Electric/Electronic Damper Actuator	2	EA	45.62	91.24	356.68	713.36	804.60
	ļ						
SUBTOTAL FOR TYPICAL BUILDING	ļ			171.08		1,148.36	1,319.44
DI III DINGO				-			
BUILDINGS:		-	474.00				
P 1955, 1956	2	EA EA	171.08	342.16	1,148.36	2,296.72	2,638.88
P 2055,2056,2155,2156	4	EA	171.08	684.32	1,148.36	4,593.44	5,277.76
	ļ						
	<u> </u>						
				S			
SUBTOTAL	Kanneses	W1400 - 1000 - 1000 - 1000		1,026.48		6,890.16	7,916.64
WORKERS COMP INSURANCE	8.7%			89.30		alika a sakaban mengenerak Managan mengan mengenerak	
SUBTOTAL	i.		Brahamanini dan salam Rahamanini dan salam	1,115.78		6,890.16	8,005.94
OVERHEAD & BOND	16.8%					1,157.55	1,345.00
PROFIT SUBTOTAL	10.53		et erene series kilokususti.	1,303.24	BURGISS TO STATE !	8,047.71	9,350.94
	10.0%			130.32	And Stranded	804.77	935.09
CONTINGENCY				1,433.56		8,852.48	10,286.04
TOTAL ESTIMATED COST	20.0%			286.71		1,770.50	2,057.21
TOTAL ESTIMATED COST			The second secon	1,720.27		10,622.97	12,343.24
			<u> </u>				

ENG FORM 150					***	.S. GOVERNMENT P	RINTING OFFICE 1959 0-516148
1 AUG 59			PREVIOUS EDIT	ION MAY BE USI	ED		ļ

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED					
				7-Apr-93		SHEET	OF		
Project					BASIS FOR ESTIMATE				
UPDATE EXISTING EEAP									
Location					X	Code A (No	iesign completed)		
FORT CARSON, COLORADO					_	Code B (Prei	iminary design)		
Architect-Engineer					_	Code C (Fina	l design)		
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVD	., DENV	/ER, CO 8	0227		Other (Speci	(v)		
Drawing No.		Estima			Checked b				
-		John N	lekis		T. FORS	-			
	Quan	titv	ı	Labor		aterial			
GROUP 12: CO ADMIN & SUPPLY	No.	Unit	Per		Per		Total		
	Units	Meas.	Unit	Total	Unit	Total	Cost		
	Cinta	meas.	Oint	1 Otal	Oille	1 Otal	COST		
Valve 2-Way, 1/2", with electric/electronic actuator	2	EA	45.62	91.24	197.00	394.00	485.2		
Valve 3-Way, 1/2 , with electric/electronic actuator	1	EA	79.84	79.84	435.00	435.00	514.8		
Tailo o Tray, E 1. That clocallo/Glocal Offic actuator	 		79.04	19.04	435.00	433,00	514.0		
SUBTOTAL FOR TYPICAL BUILDING				171.08		829.00	1,000.0		
				171.00		020.00	1,000.0		
BUILDINGS:									
P 1957, 1958	2	EA	171.08	342.16	829.00	1,658.00	2,000.1		
P 2057,2058,2157,2158	4	EA	171.08	684.32		3,316.00	4,000.3		
P 2257,2258,2457,2458	4	EA	171.08	684.32		3,316.00	4,000.3		
P 2557,2558	2	EA	171.08	342,16		1,658.00	2,000.1		
							_,,,		
							····		
					i				
SUBTOTAL				2,052.96		9,948.00	12,000.9		
WORKERS COMP INSURANCE	8.7%			178.61					
SUBTOTAL	ego microcannos			2,231.57		9,948.00	12,179.5		
OVERHEAD & BOND	16.8%			374.90		1,671.26	2,046.1		
SUBTOTAL				2,606.47		11,619.26	14,225.7		
PROFIT	10.0%		Lance Control	260.65	a view	1,161.93	1,422.5		
SUBTOTAL	Erran Johnson	incompletes and the	Company Services	2,867.12		12,781.19	15,648.3		
CONTINGENCY	20.0%			573.42		2,556.24	3,129.6		
TOTAL ESTIMATED COST				3,440.54		15,337.43	18,777.9		
	1	1							

1 AUG 59

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED				
				7-Apr-93		Code B (Preliminary design) Code C (Final design) Other (Specify) ked by FORSTER Material BY Total Cost 42.00 342.00 52.00 504.00 92.00 392.00		
Project					BASIS FO	R ESTIMATE		
UPDATE EXISTING EEAP								
Location					×	Code A (No	design completed)	
FORT CARSON, COLORADO					_	Code B (Pre	liminary design)	
Architect-Engineer	_		_		 	Code C (Fina	al design)	
EMC ENGINEERS, INC., 2750 S. WADSWORT	H BLVD	., DENV	/ER, CO 8	0227		Other (Speci	fy)	
Drawing No.		Estima	itor		Checked b	ıy		
		John M	Aekis		T. FORS	TER		
	Quan	tity		Labor	М	aterial		
GROUP 13: BN ADMIN & CLRM	No.	Unit	Per		Per		Total	
	Units	Meas.	Unit	Total	Unit	Total	Cost	
Valve 2-Way, 1-1/2", with electric/electronic actuator	1	EΑ	57.03	57.03	342.00	342.00	399.03	
Valve 2-Way, 1*, with electric/electronic actuator	2	EΑ	45.62	91.24	252.00	504.00	595.24	
Valve 3-Way, 1-1/2", with electric/electronic actuator	1	EΑ	57.03	57.03	392.00	392.00	449.03	
SUBTOTAL FOR TYPICAL BUILDING				148.27		896.00	1,044.27	
			2					
BUILDINGS:								
P 2350, 1853	2	EA	148.27	296.54	896.00	1,792.00	2,088.54	
P 2060, 2160	4	EA	148.27	593.08	896.00	3,584.00	4,177.08	
P 2352, 2700	4	EA	148.27	593.08	896.00	3,584.00	4,177.08	
								
					<u> </u>			
0110707								
SUBTOTAL SUBTOTAL				1,482.70	-	8,960.00	10,442.70	
WORKERS COMP INSURANCE	8.7%			128.99	all and the	1		
SUBTOTAL OVERHEAD & BOND	40.00			1,611.69		8,960.00	10,571.69	
	16.8%			270.76		1,505.28	1,776.04	
PROFIT	10.00			1,882.46		10,465.28	12,347.74	
SUBTOTAL	10.0%			188.25		1,046.53	1,234.77	
CONTINGENCY	20.0%			2,070.71		11,511.81	13,582.51	
TOTAL ESTIMATED COST				414.14 2,484.85		2,302.36	2,716.50	
TOTAL BUILDING ED COOL	S. A. Best And	200 - 100 - 110 may		2,404.00		13,814.17	16,299.02	
ENG FORM 150	1					I COVERNMENT	PRINTING OFFICE 1959 0-516148	
1 AUG 59		ſ	PREVIOUS EDIT	TON MAY BE USE			THIRITING OFFICE 1800 COTOLS	

CONSTRUCTION COST ESTIMATE			DATE PR				
				7-Apr-93		SHEET O	F
Project					BASIS FO	R ESTIMATE	
UPDATE EXISTING EEAP	·····						
Location					X	•	sign completed)
FORT CARSON, COLORADO						Code B (Prelim	
Architect-Engineer					_	Code C (Final d	lesign)
E M C ENGINEERS, INC., 2750 S. WADSWORT	TH BLVD	., DENV	ER, CO 8	0227		Other (Specify)	
Drawing No.		Estima	tor		Checked b	у	
		John N	Mekis		T. FORS	ΓER	
	Quan	tity	!	Labor	М	aterial	
GROUP 14: GYM		Unit Meas.	Per Unit	Total	Per Unit	Total	Total Cost
BUILDING 2357							
Valve 3-Way, 3/4", with electric/electronic actuator	4	EA	45.62	182.49	242.00	968.00	1,150.4
Valve 3-Way, 1-1/2", with electric/electronic actuator	2	EΑ	57.03	114.05	392.00	784.00	898.0
New Electric/Electronic Damper Actuator	9	EΑ	45.62	410.60	356.68	3,210.12	3,620.7
BUILDING 1856							
Valve 3-Way, 1", with electric/electronic actuator	4	EA	45.62	182.49	282.00	1,128.00	1,310.4
Valve 3-Way, 1-1/2", with electric/electronic actuator	2	EA	57.03	114.05	392.00	784.00	898.0
New Electric/Electronic Damper Actuator	9	EA	45.62	410.60	356.68	3,210.12	3,620.7
SUBTOTAL WORKERS COMP INSURANCE SUBTOTAL	8.7%			123.04		10,084.24	11,498.
OVERHEAD & BOND	16.8%			258.27		1,694.15	1,952.4
SUBTOTAL				1,795.59		11,778.39	13,573.9
PROFIT	10.0%			179.56	<u> </u>	1,177.84	1,357.4
SUBTOTAL		Parallel Control		1,975.15	3	12,956.23	14,931.3
CONTINGENCY	20.0%	The same and the same	es a visantaire	395.03		2,591.25	2,986.2
TOTAL ESTIMATED COST	Mary was against the		engeris de la Baser, e	2,370.18		15,547.48	17,917.6
			1				

CONSTRUCTION COST ESTIMATE			DATE PR						
			<u> </u>	7-Apr-93		SHEET	OF		
Project UPDATE EXISTING EEAP					BASIS FO	R ESTIMATE			
Location					1 x	Code A (No	design completed)		
FORT CARSON, COLORADO				i	Code B (Preliminary design)				
Architect-Engineer					1	Code C (Fina			
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVD)., DEN\	/ER, CO 8	0227		Other (Speci			
Drawing No.		Estima			Checked b				
		John M	Aekis		T. FORS	TER			
	Quan	tity	ſ	Labor	м	aterial			
GROUP 15: UNIT CAHPEL	No.	Unit	Per		Per		Total		
	Units	Meas.	Unit	Total	Unit	Total	Cost		
BUILDING 2359 & 1850									
New Electric/Electronic Damper Actuator	2	EA	45.62	91.24	356.68	713.36	804.60		
Valve 3-Way, 2", with electric/electronic actuator	2	EA	79.84	159.68	435.00	870.00	1,029.68		
Valve 3-Way, 1-1/4", with electric/electronic actuator	2	EA	57.03	114.05	332.00	664.00	778.05		
Valve 2-Way, 1-1/2", with electric/electronic actuator	2	EA	57.03	114.05	342.00	684.00	798.05		
Valve 3-Way, 2-1/2", with electric/electronic actuator	2	EA	91.24	182.49	1,350.00	2,700.00	2,882.49		
		<u> </u>							
	ļ								
	<u> </u>								
	 								
	 	-							
	 	 							
	 								
	 								
	 								
SUBTOTAL	gen en en en		Saltre un der	661.52	gen (to 12 min a sec.	5,631.36	6,292.88		
WORKERS COMP INSURANCE	8.7%			57.55					
SUBTOTAL				719.07		5,631.36	6,350.43		
OVERHEAD & BOND	16.8%	er in an		120.80		946.07	1,066.87		
SUBTOTAL		34.44.E.	1,22,7	839.87		6,577.43	7,417.30		
PROFIT	10.0%		42 73	83.99		657.74	741.73		
			2.02.2.2.00	923.86		7,235.17	8,159.03		
CONTINGENCY	20.0%	Kinamana Shakarak S		184.77		1,447.03	1,631.81		
TOTAL ESTIMATED COST	Sept. Company			1,108.63		8,682.21	9,790.84		
		$\vdash \vdash \vdash$							
MATERIAL AND AND AND AND AND AND AND AND AND AND		$\vdash \vdash \vdash$							
		 							
	<u> </u>	Щ							
ENG FORM 150							PRINTING OFFICE 1959 0-516148		

CONSTRUCTION COST ESTIMATE			DATE PR				
				7-Apr-93		SHEET	OF
Project					BASIS FO	R ESTIMATE	
UPDATE EXISTING EEAP							
Location					x	Code A (No	design completed)
FORT CARSON, COLORADO				liminary design)			
Architect-Engineer			·			Code C (Fina	
E M C ENGINEERS, INC., 2750 S. WADSWORT	u ei ve	DENN	ED CO %	0227		=	
Drawing No.	11 DEVE	Estima		0221	<u> </u>	Other (Speci	<u> </u>
Diawing No.		1			Checked b	•	
		John M			T. FORS		
	Quan	T		_abor	M	ateriai	
GROUP 16: CONS. FLD MNT SHOP	No.	Unit	Per		Per		Total
	Units	Meas.	Unit	Total	Unit	Totai	Cost
BUILDING 8000							
Valve 2-Way, 1-1/2", with pneumatic actuator	10	EA	45.62	456.22	310.00	3,100.00	3,556.2
Valve 3-Way, 1-1/2", with pneumatic actuator	1	EA	45.62	45.62	_360.00	360.00	405.6
Valve 2-Way, 4", with pneumatic actuator	1	EA	136.87	136.87	1,325.00	1,325.00	1,461.8
Valve 3-Way, 2-1/2", with pneumatic actuator	1	EΑ	79.84	79.84	1,175.00	1,175.00	1,254.8
Valve 3-Way, 2", with pneumatic actuator	1	EA	68.43	68.43	403.40	403.40	471.
							77 00
	 						
	 						
							
	<u> </u>						
							· · · · · · · · · · · · · · · · · · ·
	 					·	
							
	ļ						***
SUBTOTAL	§erik an ki Piko	SECTION AND ADDRESS OF THE PERSON ADDRESS OF THE PERSON AND ADDRESS OF THE PERSON AND ADDRESS OF		786.98		6,363.40	7,150.3
WORKERS COMP INSURANCE	8.7%			68.47			
SUBTOTAL	Property (States)	5		855.44		6,363.40	7,218.8
OVERHEAD & BOND	16.8%			143.71		1,069.05	1,212.7
SUBTOTAL		397.4		999.16		7,432.45	8,431.6
PROFIT	10.0%			99.92		743.25	843.1
SUBTOTAL	(man makes			1,099.08	Access of	8,175.70	. 9,274.7
CONTINGENCY	20.0%	27.75		219.82		1,635.14	1,854.9
TOTAL ESTIMATED COST	kon en en en en en en en en en en en en en			1,318.89	and the second second	9,810.84	11,129.7
						.,	, . 2 3 . 2
							
							
		-					
ENG FORM 150				1			

CONSTRUCTION COST ESTIMATE			DATE PR	EPARED			
				7-Apr-93		SHEET	OF
Project					BASIS FO	R ESTIMATE	•
UPDATE EXISTING EEAP							
Location					х	Code A (No	lesign completed)
FORT CARSON, COLORADO	_	Code B (Prei	iminary design)				
Architect-Engineer					l _	Code C (Fina	ıl design)
E M C ENGINEERS, INC., 2750 S. WADSWORT	H BLVD)., DEN\	ER, CO 8	0227		Other (Speci	fy)
Drawing No.		Estima			Checked b		
-		John N	lekis		T. FORS	-	
	Quan	titv		Labor	1	aterial	
GROUP 17: D/S ORG. MAINT	No.	Unit			Per		Total
	Units	1	Unit	Total	Unit	Total	Cost
BUILDING 8030	1			, , , , , , ,			
201231144 0000							
Valve 3-Way, 3/4", with pneumatic actuator	1	EA	34.22	34.22	210.00	210.00	244,22
Valve 3-Way, 1-1/4", with pneumatic actuator	1	EA	45.62	45.62	 	300.00	345.62
Valve 3-Way, 2", with pneumatic actuator	4	EA	68.43	273.73		1,613.60	1,887.33
	Ϊ́	- · -	55.70		155.40	.,0.00	1,001.00
		 					
Market Control of the							
and the second s							A STATE OF THE STA
	1	<u> </u>					
						-	
				•			
SUBTOTAL	A 11.000 (1.700)			353.57		2,123.60	2,477.17
WORKERS COMP INSURANCE	8.7%			30.76			
SUBTOTAL	SANGER TO THE SE	i pagyana ang		384.33		2,123.60	2,507.93
OVERHEAD & BOND	16.8%			64.57		356.76	421.33
SUBTOTAL	, and a si			448.90		2,480.36	2,929.26
PROFIT	10.0%			44.89		248.04	292.93
SUBTOTAL				493.79	20 - 10 A	2,728.40	3,222.19
CONTINGENCY	20.0%			98,76	- Carrie Fil	545.68	644.44
TOTAL ESTIMATED COST		12002	- 1 - 1	592.55	2011	3,274.08	3,866.63
	<u> </u>						
	ļ						
	<u> </u>						
	<u> </u>						
7404		\sqcup					
	<u> </u>	<u> </u>					
ENG FORM 150					4	J.S. GOVERNMENT I	PRINTING OFFICE 1959 0-516148
1 AUG 59			PREVIOUS EDI	TION MAY BE US	ED		

CONSTRUCTION COST ESTIMATE			DATE PRI	EPARED			
				7-Apr-93		SHEET	OF
Project					BASIS FO	R ESTIMATE	
UPDATE EXISTING EEAP							
Location					x	Code A (No	design completed)
FORT CARSON, COLORADO						Code B (Prei	liminary design)
Architect-Engineer						Code C (Fina	
EMC ENGINEERS, INC., 2750 S. WADSWORT	H BLVD	DEN\	/ER. CO &	0227	_	Other (Speci	
Drawing No.		Estima			Checked b		• 77
- · · · · · · · · · · · · · · · · · · ·		John M		T. FORSTER			
	Quan		·	_abor		ateriai	
GROUP 18: DS MAINT SHOP	No.	Unit	Per	Labor		ateriai	Tatal
SHOOP 16: DS MAINT SHOP				7.4.1	Per	T.A. 1	Total
DINI DINIO es se	Units	Meas.	Unit	Total	Unit	Total	Cost
BUILDING 8142	ļ					<u> </u>	
V-1 0 VAL 4 (0H - 11)	 						
Valve 3-Way, 1/2", with pneumatic actuator	1	EA	34.22	34.22	190.00	190.00	
Valve 3-Way, 1-1/2", with pneumatic actuator	1	EA	45.62	45.62		360.00	405
New Pneumatic Damper Actuator	4	EA	34.22	136.87	186.00	744.00	
Valve 3-Way, 3/4", with electric/electronic actuator	2	EA	45.62	91.24	242.00	484.00	575
Valve 2-Way, 4", with pneumatic actuator	1	EA	136.87	136.87	1,325.00	1,325.00	1,461
	ļ						
	<u> </u>						
							
was a second of the second of							
	<u> </u>						
					:		
	ļ						
							6
SUBTOTAL		wanimen. 3	BONDONA SA APARAS	444.81	Was a change of the same	3,103.00	3,547
WORKERS COMP INSURANCE	8.7%	C. 2000		38.70		line and an experience	
SUBTOTAL				483.51	The Market State Control of the Cont	3,103.00	3,586
OVERHEAD & BOND	16.8%			81.23		521.30	602
SUBTOTAL	Section of the section of			564.74		3,624.30	4,189
PROFIT	10.0%	****		56.47		362.43	418
SUBTOTAL				621.22		3,986.73	4,607
CONTINGENCY	20.0%			124.24		797.35	921
TOTAL ESTIMATED COST			(48)	745.46		4,784.08	5,529
						,	-,020
	l					· · · · · · · · · · · · · · · · · · ·	
	 						
] ;	l l		1	1	

	UNIT REPAIR COSTS							
					 			
***** Site Info	mation *******							
LOCATION:	FT. CARSON, COLORADO							İ
PROJECT:	FT. CARSON EEAP UPDATE							
Electrician	20.67	\$/Hr						
Plumer	22.81	\$/Hr						
		1						
		Quo	intity	Mate	erial	labo	W	Total
LOOKUP	Description	No.	Unit	\$ Per	Total	HRS Per	Total	
INDEX		Units	Meas	unit	\$	Unit	\$	Cost \$
AE100	New Electric/Electronic Valve Actuator: 1/2'-2'	1	EA	191.70				
AE150	New Electric/Electronic Valve Actuator: 2" & Up	1	EA	339.70			45.62	237.3
AE200	New Electric/Electronic Damper Actuator	1	EA	356.68			45.62	
AP100	New Pneumatic Valve Actuator	1	EA	181.00		2.0	45.62	402.3
AP200	New Pneumatic Damper Actuator	 	EA	186.00		1.5	34.22	215.2
EV2100	Valve 2-Way, 1", with electric/electronic actuator	1	EA	252.00		1.5	34.22	220.2
EV2125	Valve 2-Way, 1-1/4*, with electric/electronic actuator	1	EA	 	252.00	2.0	45.62	297.6
EV2150	Valve 2-Way, 1-1/2*, with electric/electronic actuator	1		327.00	327.00	2.5	57.03	384.0
EV2200	Valve 2-Way, 2*, with electric/electronic actuator		EA EA	342.00	342.00	2.5	57.03	399.0
EV2250	Valve 2-Way, 2-1/2", with electric/electronic actuator	1	EA	467.00	467.00	3.5	79.84	546.8
EV2300	Valve 2-Way, 3*, with electric/electronic actuator	1	EA	1,325.00	1,325.00	4.0	91.24	1,416.2
EV2400	Valve 2-Way, 4*, with electric/electronic actuator	1	EA	670.00	670.00	4.5	102.65	772.6
EV250	Valve 2-Way, 1/2", with electric/electronic actuator	 	EA	955.00	955.00	7.0	159.68	1,114.6
EV2600	Valve 2-Way, 6", with electric/electronic actuator	 	EA	197.00	197.00	2.0	45.62	242.6
EV275	Valve 2-Way, 3/4°, with electric/electronic actuator		EA	3,250.00	3,250.00	9.5	216.70	3,466.70
EV3100	Valve 3-Way, 1*, with electric/electronic actuator	1	EA	222.00	222.00	2.0	45.62	267.63
EV3125	Valve 3-Way, 1-1/4", with electric/electronic actuator	1	EA	282.00	282.00	2.0	45.62	327.6
EV3150	Valve 3-Way, 1-1/2", with electric/electronic actuator	1	EA .	332.00	332.00	2.5	57.03	389.0
EV3200	Valve 3-Way, 2', with electric/electronic actuator	1	EA	392.00	392.00	2.5	57.03	449.0
EV3250	Valve 3-Way, 2-1/2*, with electric/electronic actuator	1	EA	435.00	435.00	3.5	79.84	514.84
EV350	Valve 3-Way, 1/2", with electric/electronic actuator	1	EA	1,350.00	1,350.00	4.0	91.24	1,441.24
EV375	Valve 3-Way, 3/4*, with electric/electronic actuator	1	EA	222.00	222.00	2.0	45.62	267.62
PV2100	Valve 2-Way, 1', with pneumatic actuator	1	EA	242.00	242.00	2.0	45.62	287.62
PV2125	Valve 2-Way, 1-1/4*, with pneumatic actuator	1	EA EA	220.00	220.00	1.5	34.22	254.22
PV2150	Valve 2-Way, 1-1/2*, with pneumatic actuator	1	EA EA	295.00	295.00	2.0	45.62	340.62
PV2200	Valve 2-Way, 2", with pneumatic actuator		EA EA	310.00	310.00	2.0	45.62	355.62
PV2250	Valve 2-Way, 2-1/2", with pneumatic actuator	<u>;</u>		435.00	435.00	3.0	68.43	503.43
PV2300	Valve 2-Way, 3°, with pneumatic actuator		EA EA	1,150.00	1,150.00	3.5	79.84	1,229.84
PV2400	Valve 2-Way, 4*, with pneumatic actuator		EA	1,075.00	1,075.00	3.5	79.84	1,154.84
PV250	Valve 2-Way, 1/2*, with pneumatic actuator	<u>'</u>	EA	1,325.00	1,325.00	6.0	136.87	1,461.87
PV2500	Valve 2-Way, 5", with pneumatic actuator		EA EA	165.00	165.00	1.5	34.22	199.2
PV2600	Valve 2-Way, 6', with pneumatic actuator		EA	2,175.00	2,175.00	8.0	182.49	2,357.49
PV275	Valve 2-Way, 3/4*, with pneumatic actuator		EA EA	2,350.00	2,350.00	9.0	205.30	2,555.30
PV3100	Valve 3-Way, 1', with pneumatic actuator	1	EA	190.00	190.00	1.5	34.22	224.22
PV3125	Valve 3-Way, 1-1/4", with pneumatic actuator	1	EA	250.00	250.00	1.5	34.22	284.22
PV3150	Valve 3-Way, 1-1/2*, with pneumatic actuator	1	EA EA	300.00	300.00	2.0	45.62	345.62
PV3200	Valve 3-Way, 2*, with pneumatic actuator		EA	360.00	360.00	2.0	45.62	405.62
PV3250	Valve 3-Way, 2-1/2*, with pneumatic actuator	1	EA	403.40	403.40	3.0	68.43	471.83
PV350	Valve 3-Way, 1/2", with pneumatic actuator	1	EA EA	1,175.00	1,175.00	3.5	79.84	1,254.84
PV375	Valve 3-Way, 3/4", with pneumatic actuator		EA	190.00	190.00	1.5	34.22	224.22
VD100	Valve Demolition		EA EA	210.00	210.00	1.5	34.22	244.22
		1	EA :	0.00	0.00	2.0	45.62	45.62

TAB 2

BUILDING SURVEY FORMS

This section is generally grouped by building type and numerically by the "primary" building and related buildings.

The primary buildings are:

P-1007	Dispensery
P-1118	Barracks
P-1227	Dental Clinic
P-1446	Indoor Pool
P-1526	Community Center
P-1528	Library
P-1855	Dental Clinic
P-1864	Chiller Plant
P-1955	DET Day Room
P-1957	Co. Admin./Supply
P-2350	BN Admin.
P-2357	Gymrasium
P-2359	Chapel
P-6220	Hospital Clinic
P-6230	Hospital Ward
P-8000	Maintenance

-	<u>GENERAL_BUILDING_DATA</u>	
	BLDG #: P-1007 BLDG NAME: DISPUNSARY SURVEYED BY JOE/ATN DATE: SEPT '92 BLDG CON CONTACT TELEPHONE NUMBER: X 3610 BLDG USAG TOT BLDG AREA: 3818 SF # OF FLOORS: 1	JOB #: 124 TACT: E: DISPANSEY # OF PEGPLE:/ 30
	SATURDAY: TO S SUNDAY: TO T	IRST SHIFT: ECND SHIFT: HIRD SHIFT: OLIDAYS:
	ENVIRONMENTAL CONDITIONS:	
	HEATING SETPOINTS WEEKDAYS WEEKENDS W DAY NIGHT DAY NIGHT DAY PRESENT T'STAT: 75 75 75 75 REQUIRED T'STAT: 68 55 55 78 THERMOSTAT LOCATION(S): Weiting room. HUMIDIFICATION REQUIREMENTS (RH): H'STAT	COOLING SETFOINTS EEKDAYS WEEKENDS NIGHT DAY NIGHT 25 25 LOCATION(S):
	2) 2 lamp Troffers (F) 26x2 2184 w 2) 8 single Wreparounds 336 w Tot: 2520 w	MISUN OFF
	ELECTRIC EQUIPMENT: AREA (SF) TYPE (KW) W/SF 1) TV Cooler, MRC 2)	SCHEDULE ON 0700 OFF 1600 ON OFF ON OFF ON OFF (est 5% on at right)
	INTERNAL MASS: MATERIAL: block well ESTIMATE	ED MASS: M (L. M. H)
	INFILTRATION: LPCATION(S): open undows, do	•
	CFM/LIN FT CRACK	XT Volume = 36,382 CF
	Assume no infiltration due to p	of vertibules.

SENERAL BUILDING DATA
WALLS: CONSTRUCTION COMPONENT WIDTH HEIGHT AREA (SF) U-VALUE NW Nº 4" Face Brick, 2 inch insulation, 34.0 10.5 357.0 0.1036 SE S. 4" Concrete block, interior 40.3 10.5 379.7 0.1036 NE E: Exist 1 76.3 10.5 894.4 0.1036 SW N: 1 76.3 10.5 865.1 0.1036
ROOFS: CONSTRUCTION COMPONENT WIDTH HEIGHT AREA (SF) U-VALUE Built up roofing 1" rigid 30.3 40.3 1.221 0.13 Mindation, 2" feweredays run, 66.0 34.0 2244 0.13 Y2" Formboard aim space! Compare Ceiling. Compare Ceiling.
WINDOWS: AREA (SF) NW M: D DI hung SP DF DRAFES NE F: 8(14.6): 112.8 DOI hund / Stoves SP DF DRAFES NE F: 8(14.6): 116.8 SP DF DRAFES SP DF DRAFES W: 10(14.6): 116.0 SP DF DRAFES DF DRAFES
FLOOR TYPE: SLAB CRAWL SPACE BASEMENT OTHER* AREA: 3465 SF PERIMETER: 267 LF INSULATION?YXNIN _U=
SPECIAL AREAS:
ADDITIONAL NOTES: T'Stat single set point - room temp. 74.5 +
windows open (53° Foutside), 5° difference f/treatment
romes (hatter) to usinting room Top section of coundows
soit of slut => (43" × 49"). Front door has a
ADDITIONAL NOTES: T'Stet single set point - room temp. 74.5° F Windows open (53° Foutside). 5° difference f/treatment rooms (hotter) to usinting room. Top section of coundains painted shut => (43" × 49"). Front door has a vestibule entrance. Side door are not frequently utilited.
FILM #:FRAME #:
CVETCHES.

Bldg No.: <u>P-1007</u>

Page Z of 7

^{*} Specify in "Additional Notes"

*** FMEA SURVEY OBSERVATIONS ***

GE	NE	RAL	BU	IL	DI	NG	DATA

MISCELLANEOUS BASE LOADS: DOMESTIC HOT WATER: MANUFACTURER & MODEL PRIME 150 - 40 PB FUEL SOURCE V NAT GAS ELEC OIL STM GEN OTHER* SUPPLY TEMPERATURE 134 F. DISTANCE FROM HEATER 30 FT INPUT 180K RECOVERY RATE 151.3 OPERATING SCHEDULE CONSTANT
EXTERIOR LIGHTING: TYPE NO SCHEDULE CONTROL TYPE NO SCHEDULE CONTROL TOTAL KW FUNCTION OF LIGHTS SECURITY FARKING LOT ENTRY OTHER*
ADDITIONAL COMMENTS: 40 gal cap DHW - The DHW heater produces Let water on domand. The burner flame is yellow indicating poor combustion. The circulation pump is fro zen which prevents water flow through the leater (unlone water is being used). This condition causes the heater do boil the water inside the heater tank. A storage tank (Ditor) is located adjacent to the heater. Estimated heater efficiency = 50% to 60%
FILM #: FRAME #:
ADDITIONAL SKETCHES:

* Specify in "Additional Comments"

Bldg No.: 9-1007

MECHANICAL EQUIPMENT_DATA

HEATING PLANT
PLANT DESCRIPTION: NUMBER OF UNITS: MAKE & MODEL: 1) Well Melain CP No. 736434 2)
EQUIPMENT: V BOILER DIRECT FIRED STEAM CONV #676-S TYPE: V STEAM HW CAST IRON WATER TUBE, FIRE TUBE FUEL: NAT GAS V ELECTRIC OIL OTHER
MULTIPLE UNIT OPERATION SEQUENCE: SERIES FARALLEL
BURNER STAGES: ONe
FIRING RATE/FUEL: #1: 450 MBH (MAX & Min) #2:
BURNER TYPE: V POWER: MFR POR body Gordon-Piet Mod No. 16.1-GO-03 BLOWERA _33 HP @CFM CONTRL 120 / 5 / 1A ATMOS: MFR MOD No.
HOT WATER: SUPPLY SIZE TEMPERATURE PRESSUREPSI
RATED CAPACITY: MAX BYTH IN STEAM 306,1 MBH MAX BYTH OUT 408 KBTH WELL 354,8 MBH
CONTROLS: TYPE <u>electric</u> CONDITION <u>good</u>
PLANT AUXILIARIES: FUMPS: HW 1)AHP COND (1)/AAAHP COND (2)/AAA
FANS: 1)/_/AHP @CFM
OTHER 1)/AHPAHP
AUX OPERATING SCHEDULES: FUMFS: HW 1)ON OFF 2)ON OFF COND 1)ON OFF 2)ON OFF 3)ON OFF GROWN OFF COND 1)ON OFF COND 1)ON OFF COND 1)ON OFF COND OFF
OTHER: 1) ONOFF 2) ONOFF
AUXILIARY FUEL USED: #2 OIL NAT GAS OTHER (

Bldg No.: P-1007

Page #_of_7_

*** FMEA_SURVEY_OBSERVATIONS_ ***

MECHANICAL_EQUIPME		
OPERATING SCHEDULE	: DATE STARTED <u>15 SEP</u> DATE STOFFED <u>15 MAY</u>	· · · · · · · · · · · · · · · · · · ·
	MON - FRI S	
	ENTS: <u>The boiler fires</u>	
PSISTea	n pressure.	
	···	
FILM #: FR	AME #:	
SKETCH:		
		•
*> Disregard if	the item is the same as the	∍ GENERAL BUILDING DATA.
Bldg No.: P-1007		Page <u>5 of 7</u>

MECHANICAL EQUIPMENT_DATA
MANUFACTURER JVana Climate Changemodel No. 2-12 AHU NUMBER: AHU TYPE: MULTIPE Blow - HIVOUGL (3 2018) LOCATION: Mech vide Space Served: _ (12)
FAN DATA: SUPPLY FAN HP: SUPPLY CFM: 3300 STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: STATIC PRESS: DISCON DISCON SWITCH: P.B H.O.A DISCON
COILS: HEATING: HW STM / DIRECT FIRED> NG OIL ELC OTHER COOLING: CW DX // FROM CHILLER , FROM DX UNIT REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY: STM X SPRAY ELC HW/CW COIL VALVES: 2 WAY X , 3 WAY
DAMPERS: O.A. DAMPER: (Y) N), IF YES, FIXED 30%, MODULATING 30% TO 7% R.A. DAMPER: (Y) N), IF YES, FIXED 7%, MODULATING 7% TO 7% E.A. DAMPER: (Y) N), IF YES, FIXED 7%, MODULATING 7% TO 7% ECONOMIZER: (Y) N), IF YES, FIXED 7%, MODULATING 7% TO 7% ECONOMIZER: (Y) N), IF YES, OA 1/2 RA ENTHALF COULD NOT GET ECONOMIZED OA LEAKAGE: (Y) N), IF YES, OA 1/2 RA ENTHALF COULD NOT GET ECONOMIZED OA LEAKAGE: (HONEY WELL MODUTROL ACTUATOR ON O.A./R.A. DAMPER) FILTER CONDITION: GOOD FAIR FOOR.
*PRESENT OPERATION: 0001 TO 2400 0001 TO 2400 0001 TO 2400 0001 TO 2400 0001 TO 2400 0001 TO 2400
<u>HEATING SETPOINIS COOLING SETPOINTS</u> WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
*PRESENT TEMP: +REQUIRED TMP: HUMIDISTAT LOCATION: HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AVE SOLE, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), YF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: FNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
H'STAT COMPR DAMFERS F LINKAGES FANS F SHEAVES VALVES ACTUATORS BELTS E MIXING BOX OTHER OFFICE ACTUATORS AR CONTROLLER DOES NOT AFFER TO OPERATE.
COMMENTE: 50 MIXEL AIR / COOLING COUT ON CO 65 and acount co
3 fans on condenser - 1/2 h.p./ea. Size = 10.7 Tows
Compressor 3 phase / 60 cyr / 48.8 A @ 2430 V
RAUB CITS A RLA
Bldg No.: P-1007 Page 6 of 7

مكليحا والاياب
MECHANICAL EQUIPMENT DATA NE SW. and S.E. ACTUATORS ARE HONDITROL
AIR HANDLING UNITS: 3 20185 7 All electric controls! The
MECHANICAL EQUIPMENT DATA N.E., Sw. and S.E. ACTUARDES ARE HONEYWELL CONTROL STRATEGY: 3 20185, all electric controls. The DX Compressors are activated when a sensor on the cold deek
activates a solenoid value on the retrigerant line, cooling is
alled when the cold deck reaches 65% and is off when the cold
ADDITIONAL AHU/SYSTEM COMMENTS: deck drops down to 50 of, Mis
condition causes frequent cycling of the compressor.
when OA temp reaches 80°F, The outside air dampers close to their minimum position (30%). A hand operated
close to their minimum position (30%). A Land operated
minimum positioner is located on the unit.
The steam value on the AHU is leaking so that steam reached the coil when not none is called STEAM VALVE IS OPERABLE; 1-1/2" HONEYWELL CONTROL VALUE.
racks the coil when tot none is called. HONEYWELL CONTROL VALUE.
FILM #: FRAME #: FRAME #:
SYSTEM SKETCH:

Bldg No.: <u>P-1007</u>

Page 7___of 1___

GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

Bldg Name: Dispensery Bldg #: 1007 Contact: McRie Phone #: x 35/0 Surveyed By: with Date: 11/20/89									
. 1k i	ANNEX A		ANNEX B	DATE	COMMENTS				
ECO TITLE	Al		# B01		Maybe wells & mof				
* ATION Simud WINDOWS or DOUBLE GLAZING	<u>A2</u>		# B02		131/4				
WEATHER STRIPPING and CAULKING	A3		# B03		N/A - building is preparented				
INSULATED PANELS			# BO4		NA				
VESTIBULES OF REVOLVING DOORS	A5		# B05		exist				
LOAD DOCK SEALS (Strip Door or Air Cu)	A6		B06		N/A				
REDUCTION OF GLASS AREA	-A/		B07		NA				
REPLACE KITCHEN LIGHT FIXTURES	A8		# 808		N/A				
SHUTDOWN DHW or MOD CTRLS (Non FH)	A9		B09	1	Install high eff heata				
REDUCE LIGHTING LEVELS	A10		#_B11		N/A				
REPLACE INCANDESCENT LIGHTING	A11		# B12	<u> </u>	N/A				
USE MORE EFFICIENT LIGHTING SOURCE	A12		# B10		N/A				
HIGH EFFICIENCY MOTOR REPLACEMENT	A13		B13	1	ou Mzunit				
NIGHT SETBACK/SETUP THERMOSTATS *	A14		# B14	V	3 T-stats				
INFRARED HTRS (Motor Rep Shops & Whse)	A15		# B15	1	N/A Sea B30				
ECONOMIZER CYCLES (Dry Builb Type)	A16		# B16	<u> </u>	exist but require upgrade See B3				
CONTROL HOT WATER CIRC PUMP *	A17		# B17		V/A off Kow				
FM RADIO CONTROLS	A18		818		7				
RADIATOR CONTROLS	A19		B19		N/A				
DECENTRALIZE DHW HTRS (POU Htrs) *	A20		B		N/A				
HEAT RECLAIM from HOT REFRIG GAS	A21		# B20_	1/	from small Transmit to Diti				
REDUCE AIR FLOW *	A22_		# B21		reduce minimum OA (See B32)				
PREVENT AIR STRATIFICATION *	A23		# B22	↓	N/A				
INSTALL TIME CLOCKS	A24		B23_		N/A - pump inoperative.				
CHILLER REPLACEMENT	A25		В		NA				
RETH ACE ABSORPTION CHILLER	A26		838	- 	V/A				
ATE STEAM LINES	A27		B26		N/A				
RETURN CONDENSATE	A28_		B27		N/A				
TRANSFORMER OVERVOLTAGE	A29_		B31		7 7				
TRANSFORMER LOADING	A30		B30	 	upgrade all HVAC controls				
REVISE OR REPAIR HVAC CONTROLS	A31		B32		upgade all THAC COMMIS				
WASTE HEAT RECOVERY *	A32		B33_	-	NA				
ADD ADDITIONAL LIGHT SWITCHES	A33		B35	+-	Replace w/ high eff. toiles				
HVAC INIT/BLDGS WITH SEPARATE BOILERS	A34	_	# B37		NA NA				
STANDARD SOLUTIONS for EXT LIGHTS	A35		T# 836		7				
BOILER OXYGEN TRIM CONTROLS	A		B24		?				
REVISE BOILER CONTROLS	A		B25 B28		N/A				
PRE-HEAT DHW	A		# 829	1	14.				
HEAT PUMPS	Α		# B39	1					
EMCS	^		M40,1						
HOT WATER RECIRC PUMPS	A		M41	'+					
HPS STREET LIGHTS	Α		M42						
ELECTRIC OUTLET INSULATION	A								



	***	FMEA SIMILA	R BUILDIN	IGS SURVEY F	ORM	****	
GENER	RAL BUILDIN					9/92 AJN,	
BLDG SURVE BLDG	#: <u> 50(</u> P) YED BY: PK USE: <u>OISPE</u>	BLDG NAME: <u>D</u> [/RT BLDG CO <u>USARY</u> # FLO	ISAENSA ONTACT: 0 OORS: 1 #	RY DATE:	ELEPHONE BLDG ARE	JOB #: 124 EXT: 5356 A: 4047 SF	
BLDG	OCCUPANCY	SMTWT	h F S	0700 TO 1	600		
T'ST/	AT SETTING	: HTG: 75 / CLG:/		AUTO SETBAC	K: N / Y	:/	
Tempe	erature.Fu	ture, inside, ture, inside,	Occupied:	:70/78		resent: nge/hR: <u>Ø</u>	
ARCH	ITECTURAL	WALLZ	AREA	U-value	· 	UA 747.	
		GLASS ROOF FLOOR	346	1.176 .108 .86	1,S	27 37 41 27	' .
Avg. Windo Windo # En	Floor-Cei ow frame t ow size: try doors:	ling Height; ype: Alum So Rolow 5 # OH		loor type:S Operable se CURT % of Ar	IAB Insections: C Infiltra rea Condi	ulated: YAN Y)/N tion LMH tioned:) -
		: FLOURESCE					
ELEC	TRICAL EQU	IP:OFFICE I	<pre>KW/Unit:_</pre>	#Units:	<u> </u>	1 Frac:	-
DHW:	TYPE: NG	ELEC CONV	Supply AFUE:	Temp: 140°	GAL/Pers	on-Day:	•
MECH	ANICAL		HEA	TING 🗸	C00	LING	
	Primary S	ystem:	HTHW	17 HM		10LING	-
	Fuel:			<u> </u>	ELEC		-
	Capacity:	Del.Effic:	13.1%	BTUH	20 Tor	75	-
	Months ON		8		4		<u>-</u>
	Hours ON:		5808)	7957		-
AHUs			1				-
	cfm:		4740		4790		-
	Min	omizer:	50%.	·	DUMB	·	-
	7 70005 -	- East /u)act		Suma	er - if Tera	trops darpors de	ose.
MISC	VESTIB	ms controlled by ULES EXIS	Summer/White T (FRONT	AND BACK)	or iftenp. Horomell	drops dampors op Elect. Controls	-Moderno
948 P	WINI DOW	15.4.41:" V	62" 01	t- Tena central on	convertor e	A d GroF	A-athoris
•	- AAIM POAA	25-32" X	48" M	N Teno sat at 15	55 OF		- -
- 1	6. <u>I-SZU</u>	R.A. Torp. co	atrol set at 7	0°F. Rafng com	pressor run	s below 70°FR	<u>.</u> A.
	Totap.	(OUER)					-

PAGE 1 of 2

FT CARSON ESAP BLOG. 1150 DATE: 9/92 Surveyor: AJN Page 2 of 2

- · AHU runs continuously
- · T-STAT opens & closes 3-way Htg. Value to maintain proportonp. in Space.
- · Htg. T-STAT Set at 65°F
- · Zone Danpon T-STATS 8et at 68°F
- · STAFF COMPLAINS OF DRAFTIC TEMPERATURE SWINGS IN THE BUILDING.



£3/29(93 GM)
GENERAL BUILDING DATA 4th Replacement Co ACAP G1/AG Retirement Services
`\BLDG #:\'//8 BLDG NAME: #ARRACKS IOR #: 124
SURVEYED BY: ROC DATE: HOLT 84 BLDG CONTACT: 155
TOT BLDS AREA: 51800 SF # OF FLOORS: 3 # OF PEOPLE: 350
(Note: Unwings shoust, 494 SP)
-BUILDING OCCUPANCY: MON - FRI: 16:30 TO 06:00 FIRST SHIFT: 100 SI Sec Field May MON-FRI SATURDAY: 06:00 TO 1630 SECNO SHIFT: 350 0
See Field Notes MON-FAI SATURDAY: 06:00 TO 1630 SECOND SHIFT: 350 0 SATURDAY: 00 TO 2400 THIRD SHIFT: 350 0
HOLIDAYS: TO HOLIDAYS:
ENVIRONMENTAL CONDITIONS:
HEATING SETPOINTS COOLING SETPOINTS
WEEKDAYS WEEKENDS WEEKDAYS WETVENDS
DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 70 70 70
REQUIRED T'STAT: 65 55 65 55
THERMOSTAT LOCATION(S): HUMIDIFICATION REQUIREMENTS (RH): H'STAT LOCATION(S):
LIGHTING: AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE
AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE 1) ON 4:30 OFF 22:00
2) INC
4) FLUOR DN 41 20 OFF 22:00
DATA SOURCE: V OBSERVATION ASHRAE OTHER 2102 011 11/25
SEE ATTACHED SCHEDULE?YN Se 100
ELECTRIC EQUIPMENT:
AREA (SF) TYPE (KW) W/SF SCHEDULE 1) Persona / Equipment D2 for ax2 from 555
1) Personal Equipment One for any Room OFF 2) USED 0.044 Yet See Field Notes OFF
For ENTIRE Rolling
4) OBSERVATIONASHRAEOTHER
SEE ATTACHED SCHEDULE?YN
INTERNAL MACC. MATERIAL COMCOCTO
INTERNAL MASS: MATERIAL: CONCRETE _ ESTIMATED MASS: _ (L, M, H)
INFILTRATION: LOCATION (8): Windows in toilets open most of
Should Be Eins had four fit (not all)
ESTIMATED RATE: (L, M, H) or AIR CHANGES or Building Volume = 504,900 CF CFM/LIN FT CRACK
AIR CHANGES or Building Volume = 504,900 CF
2.25 AC de l l a (a + : ht)
0.50 AC dunto anon windows day / 1 1.11
0.05 AC due to doors (& at night) 0.50 AC due to open windows day (0.1 Night) 0.70 AC due to window cracks a door cracks
175 Ac Change day = 2 and
1.25 Air Changes day 0.8 Air Changes Night

*** FMEA SURVEY OBSERVATIONS _ ***

GENERAL BUILDING D	AIA					
CONSTRUCTION: WALLS! CONSTRUC NW Brick SE !! NE !!	TION COMPONENT	WIDTH	HEIGHT	(+ROSS) AREA (SF) 6,225.3 5,922.8 9,210.4 9,825.7		
<u> 1.5" R16-1</u>	TION COMPONENT PROOF WITH DINSULATION Te		HEIGHT	AREA (SF) 20,000	U-VALUE <u>0.13</u>	
	2 louble Hung 2 " " 3 " " 7 " "					8
FLOOR TYPE: AREA: مرقع /_		SPACE V	BASEMEN	T OTHE	元 体	
PERIMETER: 2870 SPECIAL AREAS: B. ADDITIONAL NOTES: IN DOWNS USE 15	oiler room no Personal rad	ios And	clocks	HEAT LOSS	From Build	
Windows Are	left open:	to rid	the exc	essive he	7 W	
winter time. 7	hs is due to	lack of	control	of basel	oud her	ev.
FILM #:FRA	AME #:				suid Mar	
SKETCHES:		•				
	GROSS WALL					
		70ne 2				
NE	5970					

Specify in "Additional Notes"

Bldg No.: _111_8____

Fage <u>2 of 8</u>

*** FMEA_SURVEY_DESERVATIONS ***

GENERAL BUILDING DATA

LIGH	LING	SUME	וטע	_⊑									Page	¤f	· ·
AREA:	(A (A)MAIN		x		SF		(B)	MEZZ_	X_:		SF			
DATA	sou	RCE:_	^I	DRAWIN	168	S	JRV	'EY TO	UR						
Mark	¦ #	lamps	;	W/Fix	: 1	#Fix	;	Flr #	:		Comme	nts	(Edw	nted U.	(248.)
I		65	-T	100	-	65	1	15	IIA	cande	.xeut .		759		1
F	!	76	!	38	. !	38	:	Moss	۱: معدم	Flue	rescut		100%	or day/	10% night
+	; 	156	i 	38	/ i	78		2 <u>nd</u>	- Plas	resce	ut		50%	on day/	50% nigh
I	:	10	!	100		10	!	znd	IIn	conda	escent			/	ion of all
F											cent_			(solo on ni
工	:	10	<i>!</i>	<u> </u>	!	10	!	3 rd	! In	c ande	scent			,	% on ni
	:						1		!						
					- - -				- -						•
	!		:				;	** ·- ·- ·- ·	: :						-
	!		!		!		1		 !				· ··· ··· ··· ·		
	ł.		:		:	· — — — — —	i		!						
	:		1				:								
			1.	 -,-	. :		:				· — — — —				
] 		1		.1		!		1			<u></u>			
							-		1	~	· — — —	··			
(A) TO	TAL:	Dog 7 (39	/ Wi	₹ <u>е</u> 69	 _Watt	 -/	3 46,	014		<u>D</u>	of No	- A		00 C 0-
(B) TO		111	4_	14	4.4 4.4			'-; 4,			8F= <u>.</u> 8F= <u>.</u>	32/0.	<u></u> W/ <u></u>	SF AFC	AREAS + mase) S AREA
ADDIT	IONA	NOT	ES.	•				·		v		•	•		

Bldg No.: 1118

Page 3 of <u>8</u>

GENERAL BUILDING DAIA	·
MISCELLANEOUS BASE LOADS: DOMESTIC HOT WATER: MANUFACTURER & MODEL Converter FUEL SOURCE V NAT GAS ELEC OIL S SUPPLY TEMPERATURE 120 F, DISTANCE FROM HEAT INPUT RECOVERY RATE OPERATING S	TERFT
EXTERIOR LIGHTING: TYPE _ NO _ 4 SCHEDULE _ 24 hows TYPE _ NO _ SCHEDULE TOTAL KW _ 0.400 FUNCTION OF LIGHTS _ SECURITY _ FARKING LIGHTER* ADDITIONAL COMMENTS: One Light Fixture AT ea	OT ENTRY
had bulbs IN Place	·
	In 11-200 mile to meet as der. The miles, del may, del may de dements and CLOSES, file as assence is detailed indication device on the face of the control peace, for file fact, delice of the miles of the control peace, for all the miles of the miles of the fact, delice of the control peace, for the fact of the control peace, for the fact of the control peace, for the fact of the fact of the control peace, for the fact of t
	DESCRIPTION CLOCK WITH GARDEN PRIMAL DESCRIPTION OF RECEIVED A 7-DAY TIME CLOCK WITH GARDEN PRIMAL DESCRIPTION OF THE PROPERTY FOR THE PROPERTY AS ABOUT AS ABOUT A FACTOR OF THE THE PROPERTY AS ABOUT A SAME OF THE CONTROL OF THE CO
	ALL NOT DECEMBED DAMPES SHALL BE MEMBELLY DESCRIBED BRANCES FOR EA- DAMPES SHALL BE MINIMALLY CLOSED. THE DATENT SEGME DALL DUE DECE / THEORYS' AT SHALL BE DECEMBED. THE DATENT SEGME FOR EACH ZO
•	THE NOT MICE TERMINATURE SMALL BE MISTED A MIT BEEF DESCRIPTIONS OF THE NOT SMALL BEEF DESCRIPTION OF THE NOT SMALL BEEF DESCRIPTION OF THE NOT MICE SMALL BEEF DESCRIPTION OF THE NOTATION OF
FILM #: FRAME #:	5. INC COLD DECE TERMEDIATURE SHALL DE RESEL DE A COLD DECE CONTROLLED DASCE CO TIME ZONE REQUIPILED THE ROSS! CODOLING. DE LON-LIMIT FOR PROBLET SHALL PREFER SHALL NO COLD STATE COLD DECE CONTROLLED ASSESS OF THE PROBLEM SHALL NO COLD STATE COLD DELE CONTROLLED SHALL SHALL NO COLD STATE COLD DELE CONTROLLED BE SHALL NO CHILD STATE SHALL NO CHILD SHALL
ADDITIONAL SKETCHÉS:	the mai, ca, as, and 64 based to commutates or the cold acce commonly something of the cold acce commonly something of the main ca, as a factor something on their something common, position something only some excess as one sold. 7. A fraction of the model position of the common of the cold acceptable of the cold accep
THILLED MATER CONTROL DIAGRAM Control of the con	DILLED MATER STRIED SEDIENCE OF OPERATION THE CHILLED MATER CIRCULATION PRIME SMALL OMESTIC MANUALITY THE BUILDING SECURITY (CARE ON) & THE BUILDING ARE TERMINATURE IS ANDLE TOTAL MANUALITY AND THE CHILLS MATER ACCORDING THE MANUALITY AND THE CHILL MATER ACCORDING THE MANUALITY AND THE OPERATION OF THE CHILL MATER ACCORDING THE THE THICK SMALL ME COSTS OF MANUAL COSTS OF MATERIAL PROPERTY OF THE CONTROLLEY COSTS OF MATERIAL MATERIAL PROPERTY OF THE CONTROLLEY CASES OF THE CONTROLLEY COSTS OF MATERIAL PROPERTY OF THE CONTROLLEY CASES OF THE CONTROLLEY CASES OF THE COSTS OF THE CONTROLLEY CASES OF THE COSTS OF
Bldg No.: 1/18	Fage 4 of 8

MECH	<u>NICAL E</u>	EQUIPME	NT_DATA)			
UNITA UNIT	•	TING EG	OUTPUT CAPACITY	HEATING SOURCE	CFM	HF	STARTER & CONTROL	SETPOINT
· · · · · · · · · · · · · · · · · · ·								
				~ ~ ~ ~ ~ ~ ~ ~				
) <u>-</u>	/							^
							t water 1	
				•			lo not han	
							1 12 reset	
							- controller	
	<u> </u>	ot tal	a into a	uccount	internal	genry_	solar gar	ns and
	<u>}</u>	he the	incl mass	of the bu	rildig.	There	solar gar are 174	Mairidua
	{	some book	d heaters	: M the b	nilding.			
FILM	#:	F!	RAME #:					
NOTE	3: TYPE			•	entilat	or, du	ct furnace,	
	HEA ⁻		wall furn DURCE>	electric,		red, o	il, steam,	
	STA	RTER &	CONTROL		ary, ma		ed, line v tained, etc	

Bldg No.: 1118

*** FMEA SURVEY OBSERVATIONS ***

MECHANICAL_EQUIPMENT_DATA
AIR HANDLING UNITS: MANUFACTURER MODEL No.
MANUFACTURER MODEL NO. AHU NUMBER: AHU TYPE: 3 ZONE M Z LOCATION: OLD KITCHEN/MESS SPACE SERVED: OFFICE & ADMIN & Day Room
FAN DATA: SUPPLY FAN HP: 3 SUPPLY CFM: 4170 STATIC PRESS: 1.2 "40 RETURN FAN HP: RETURN CFM: STATIC PRESS: LEXHAUST FAN HP: EXHAUST CFM: STATIC PRESS: DISCON DISCON LEXHAUST STATIC PRESS: LEXHAUST STATIC PRESS: LEXHAUST CFM: SWITCH: P.B. LEXHAUST LEXHAUST LEXHAUST CFM: SWITCH: P.B. LEXHAUST
COILS: HEATING: HW _ STM _ DIRECT FIRED> NG _ OIL _ ELC OTHER COOLING: CW Y DX _ FROM CHILLER C FROM DX UNIT REHEAT: # OF COILS _ TYPE _ RECOOL: # OF COILS _ TYPE HUMIDITY: STM _ SPRAY _ ELC _ HW/CW COIL VALVES: 2 WAY _ FWAY _ FROM DX UNIT
DAMPERS: O.A. DAMPER: (), N), IF YES, FIXED _ %, MODULATING 12% TO 88% R.A. DAMPER: (), N), IF YES, FIXED _ %, MODULATING 12% TO 88% E.A. DAMPER: (), N), IF YES, FIXED _ %, MODULATING _ % TO _ % Release ECONOMIZER: (), N), IF YES, OA V RA ENTHALPY () OA LEAKAGE: (), SO IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOOD _V_FAIRFOOR
SYSTEM OPERATION: MON - FRI SAT SUN *FRESENT OPERATION: O TO 24 O TO 24 *REQUIRED OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: 72 72 72 72 72 72 72 72 72 72 72 72 72
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD (5), POOR(P) T'STAT H'STAT COMPR DAMPERS LINKAGES FANS SHEAVES VALVES ACTUATORS BELTS MIXING BOX OTHER
COMMENTS: No energy To heating Coil. Brings IN outside
air 24 hr/day all year . Cooling Coil has energy
IN summer. Time clock controls supply for operation
PNEWWATER HTG & CLC, COIL VALVES - APRIX 2" & 1" - 3-WAY
Bldg No.: 1118

MECHANICAL_EQUIPMENT_DATA

Bldg No.: 1118

HEATING PLANT
PLANT DESCRIPTION: NUMBER OF UNITS: 2 MAKE & MODEL: 1) Z) Replaced KEWANEE 2,871,000 BTU RATING 2) Replaced KEWANEE 2,871,000 BTU RATING 3) KHe Steam Boyler Mod. 4505 4,500,000 BTUH
EQUIPMENT: _V BOILER DIRECT FIRED STEAM CONV TYPE:STEAM _V_HWCAST IRONWATER TUBE, FIRE TUBE FUEL: NAT GASV ELECTRIC OIL OTHER
MULTIPLE UNIT OPERATION SEQUENCE: SERIES Gas-Fired Boiler Assembly No. W-523273 Firmy Sequence LO-Hi-LO BURNER STAGES: Second boiler only used in Coldest Purt of y
FIRING RATE/FUEL:#1: #2: #2:
BURNER TYPE: V POWER: MFR KEWANEE MOD No. BLOWER/_/A 2 HP @ 3 CFM CONTRL/A
ATMOS: MFR MOD No
HOT WATER: SUPPLY SIZETEMFERATUREPRESSUREPSI RETURN SIZETEMPERATUREPRESSUREPSI
RATED CAPACITY: MAX BTUH IN 2671,000 4,500,000 BTUH MAX BTUH OUT 3,600,000 BTUH = 80% ERIJENT
CONTROLS: TYPE APRIX 2" CONVENTED VALUE (PER) FLEE OF (OK) CONDITION
PLANT AUXILIARIES: PUMPS: HW 1)A (2)(1/2) HF COND 1)A (2)(3) HF COND 1)A (2)(3) HF Sump pump
FANS: 1)/_/AHF @CFM 2)/_/AHF @CFM 3)/_/AHF @CFM
CTHER 1)/AHP
AUX OPERATING SCHEDULES: ON DEMANO FUMPS: HW 1)ONOFF2)ONOFF COND 1)ONOFF2)ONOFF FANS: 1)ONOFF2)ONOFF3)ONOFF
OTHER: 1) ONOFF 2) ONOFF
AUXILIARY FUEL USED: #2 DIL NAT GAS, OTHER

Fage _7_of_**8**_

GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

Blog Name: EM Bayacks Blog #: P-11	8 Contact	:Phon	e#:	Surveyed By: Date: 10/2
ECO TITLE	ANNEX A	DATE ANNEX B	DATE	COMMENTS
INSULATION	Al -	# B01		Com space wells
STORM WINDOWS OF DOUBLE GLAZING	A2	# B02	V	All windows
WEATHER STRIPPING and CAULKING	A3	# B03	V	All Windows And Doors
INSULATED PANELS	A4	# B04	~	
VESTIBULES OF REVOLVING DOORS	A5	# 805		N/A - Exist, other wage is low
LOAD DOCK SEALS (Strip Door or Air Cu)	A6	B06		NA
REDUCTION OF GLASS AREA	A/	B07		N/A-Sec B4
REPLACE KITCHEN LIGHT FIXTURES	A8	# 808		11/A
SHUTDOWN DHW or MOD CTRLS (Non FH)	A9	809	1/	INSTALL Separate boiler for Ditw
REDUCE LIGHTING LEVELS	A10	# B11		NA
REPLACE INCANDESCENT LIGHTING	A11	# B12		N/A-See BID
USE MORE EFFICIENT LIGHTING SOURCE	Al2	# B10	V	Replace All Incandescent lights
HIGH EFFICIENCY MOTOR REPLACEMENT	Al3	B13	~	Phase notors
NIGHT SETBACK/SETUP THERMOSTATS *	A14	# B14		N/A - Sec B19
INFRARED HTRS (Motor Rep Shops & Whse)	A15	# B15		N/A
CONOMIZER CYCLES (Dry Bulb Type)	Al6	# B16		NA
CONTROL HOT WATER CIRC PUMP *	A17	# B17		N/A - Controlled now)
FM RADIO CONTROLS	A18	B18		NA
RADIATOR CONTROLS	A19	B19	~	Intoll Room T-state + Radiator 4
DECENTRALIZE DHW HTRS (POU Htrs) *	A20	В		NA
HEAT RECLAIM from HOT REFRIG GAS	A21	# 820		NA
REDUCE AIR FLOW *	A22	# 821		NA
PREVENT AIR STRATIFICATION *	A23	# B22		NA
INSTALL TIME CLOCKS	A24	B23		N/A - Detw Pump vector 24hos
CHILLER REPLACEMENT	A25	В		NA
REPLACE ABSORPTION CHILLER	A26	838		NA
INSULATE STEAM LINES	A27	B26		NA
RETURN CONDENSATE	A28	B27		NA
TRANSFORMER OVERVOLTAGE	A29	B31		NA
TRANSFORMER LOADING	A30	B30		N/A
REVISE OR REPAIR HVAC CONTROLS	A31	B32	1	Repair OA Controls
ASTE HEAT RECOVERY *	A32	B33		NA
ADD ADDITIONAL LIGHT SWITCHES	A33	B35		NA
HVAC INIT/BLDGS WITH SEPARATE BOILERS	A34	# B37		leplace boilers
STANDARD SOLUTIONS for EXT LIGHTS	A35	# B36	~	install P.E. suitales.
BOILER OXYGEN TRIM CONTROLS	A	B24		NA
REVISE BOILER CONTROLS	À	B25	1	NA
PRE-HEAT DHW	A	B28		NA
HEAT PUMPS	A	# B29	1	NA
EACS	A	B39	1	
HOT WATER RECIRC PUMPS	À	M40,17	1	
HPS STREET LIGHTS	Â	M41		
ELECTRIC OUTLET INSULATION	À	M42	 	

Page 8 + 8



ch> Denotes ECO's studied by Burns & McDonnel
<#> Denotes ECO's common to Military Family Housing

<u>E M C ENGINEERS, INC.</u>

Denver • Colorado Springs • Atlanta • Germany 1118 P-450

JOB FECLESON EZAP	UPDATE
SHEET NO.	
CALCULATED BY AUN	DATE 9/9Z
	DATE
SCALE	

AHU (Multizone)

Fan Motor is running; belt is broken so fan inoporable.

No Main Air TO HVAC system. Un able to Test Controls.

Only one boiler being used

Honoyauel Controls (Fleed.) operate the Z-way Steam Values to the Zconverters.

Bldg. is currently under venovation. F-NEW unchanged @ Porces -FEMILE BARRIES 6 ffices 0800 To 1730

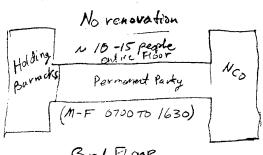
1ST FLOOR (M-F)Currentuse (No renovation) 24 people porday. 6700 - 1700 One office NCO oscupants Znd Floor Classym

The East Zone when Temp. is Set at 1000F (Honeywell Modutro 24 V) 20 watts) The West Zone " " " " at 105% ("

The East Zone control does not actuate Value 11 Weg 11 " does actual value (setting control at 180°F spens value). Both are 2" control Values

All new Lighting & Girid Geiling ~ 8.5' HT. Recessed 2X4' FLUOR, ZTUBE FIX.

N 1.5 W/SF for 6 Pros ~ 1.0 W/SF for Hallways.



3rd Floor

****	FMEA SIMILA	R BUILDINGS	SURVEY FOR	CCAW	~ (
_RAL BUILDIN	NG DATA BUI	Iding 15 curre	ing Center Di	ovation. 9/9	
BLDG #: 121 PE SURVEYED BY: HA BLDG USE: RARR					26
BLDG OCCUPANCY:	SMTWT SMTWT	h F S	TO 240	<u>>0</u>	
T'STAT SETTING:	: HTG: 78 /		TO SETBACK:	N / Y:/_	
Temperature,Fut Temperature,Fut	ture, inside,	<u> آن Occ</u> upied	/ · · · · · · ·	Temp Present: <u>]</u> AirChange/hR: <u>]</u>	
ARCHITECTURAL		AREA	U-value	UA	
• .		1,428	.288	_6,171,	
		<u>6306 </u>	1.17.6	<u> </u>	<u>. </u>
	FLOOR	9,762	, 86	879 16,873	
Avq. Floor-Ceil low frame ty low size: So Entry doors:	ype: Alum e Below	Wood Op	erable sect RT In	ろ Insulated: ' ions: ① / N	60 H ⁽ ,
LIGHTING: Type:	: Flourescent	Wa	tts/SF: <u>,</u> 5]	_ Util Frac:_	
ELECTRICAL EQUI	ip:Office k	W/Unit:	#Units:	Util Frac:	
DHW: TYPE: NG/	ELEC/CONV FROM STEAM	Supply Tem AFUE: 60	p:172° GA	L/Person-Day:_	
MECHANICAL		HEATIN	G	COOLING	
Primary Sy	ystem:	2- BOILER:	<u> </u>	CHW	
Fuel: Capacity:		GAS FIRE	PUT (EA)	NAG (CP)	
	Del.Effic:	45%		52.12%	
Months ON	•	8		4	· · · · ·
Hours ON: AHUS Hp:		5808		<u> 2952 </u> 4.25	
cfm:		16:7 K		16.7 K	
Min (OA:	100%		100%	
Econ	omizer:	_//0		<i>NO</i> :	
MISC:					•
· G MZU:	2 per Floo	R.		·	C.
· 1-574		@ Z.5 HP	/ 11.200 CFD	n - Mess Hall	
· 1- 57-U	w/ Dampers	(a) 1.75 H	7/ 5,500 CF		
· Lu Mala	usc — \a.	111 Blda 111	と		

PAGE L of L

	JOB FT CARSON EEAP UPPATE		
	SHEET NO.		
E M C ENGINEERS, INC.	CALCULATED BY _AJN	DATE 9/9Z	
Denver • Colorado Springs • Atlanta • Germany	CHECKED BY	, DATE	
P-1217	SCALE	· · · · · · · · · · · · · · · · · · ·	
Multizone Altus <u>cw pum</u>	R	110 Birason	
MER 1ST	East	ND. PUMPS	
LST. East MER (MEU-Z) 7.5 HP	, 200Vet 25.41	at 3/4HP (15T. EasT) 30U at 5.2 Amp.	
	T GACH! [FERT	Ist West)	
1ST. WEST MER (MZU-1) Typical	. N	-same	
12-way 31m	Valve is 1 1/4" (Pnev.)		
	112 (1110)	Grenaul Notes:	
IST East MER Mixed Air -	IST WEST MER	Genan Totes.	
M74-2 (3 zomen) Setpti	m=U-1 (3 zones)	IST FLOOR:	
4 actuators on 14 + Ocal	3 actuators in	EMT School	
mixing dangers. Hot Deck Set at 750F	mixing dampas.	Zhoi Floo L' (East Half	
Culded	-	NBC School (Temp	
13 act for Mixing Dunagore Set at 5	ò°F)	Nuclear Biological	
		EChemical Warfare	
2nd East MER B	Smi,	6:30 TO 6:00pm 2: 20T340 Poople Sev	
M フルーム			
7.5HP, 2000 et 25.4 Aug. Main BIR	15 7	7 7500 = 4:30 pm (M- 4 people,	
3 Actuators for Mixing Rite B.	LR. (Same as 6thar Bldg)		
other B	ur is	Entire Blog.	
and West ok Orig. Ken	rance.	7:30 -5:30	
Auto control o	in lation of	2 people peroffice	
3.1 Fast of removed?)	/ Si	miliar construction	
	f	+ P-1117	
3 rd West 15 K	m	sa. Hyde	
	 	2112 or 2735	
		H-ELMO; Pat Molle	
	Ex. 3.		
	2	491	
>			
	\		

1,#

***	FMEA SIMIL	AR BUILDI	NGS SURVEY	FORM	***
RAL BUILDI	NG DATA	bandoned			9/92- AJN
BLDG #: 1218(P) SURVEYED BY: PK BLDG USE: RARE	BLDG NAME:	BARRACK ONTACT: J	ACORSON	TELEPHONE	EXT: 5283
BLDG OCCUPANCY	SMTW	Th F S Th F S	0001 TO	2400	
T'STAT SETTING	: HTG: 800/		AUTO SETBA	CK: (N) / Y:	/_
Temperature, Fu	CLG: <u>76</u> / ture,inside ture,inside	,Occupied ,Unoccupi	: <u>65/78</u> ed: <u>55</u>		esent: <u>80</u> ° ge/hR: <u>1.07</u>
ARCHITECTURAL					11.6
	WALL	21,428	U-value 288.	e	<u>UA</u>
•	GLASS =	6306	1.176		16
	ROOF	18,518	.13	2,4	
	FLOOR _	1,022			79
	-	69,762			_
Avg. Floor-Cei dow frame t dow size: S Entry doors:	ivne: Alum	il Wood	Operable so	ections: 4	/ N
LIGHTING: Type	:: Flourescer	it	Watts/SF:	<u>57</u> Util	Frac:
ELECTRICAL EQU	IIP:OFFICE	KW/Unit:_	#Units	: Util	Frac:
DHW: TYPE: NG/	'ELEC/CONV	Supply AFUE: <u>(</u>	Temp: <u>~160</u>	GAL/Perso	n-Day:
MECHANICAL		. UEA	TINC	COOL	TNC
Primary S	vstem:	2-ROIL	TING	CHW	ING
Fuel:		GAS FIR			P)
Capacity:		287MP	H INPUT (EA)	`	24
Months ON	Del.Effic:	49%		52.12	76
Hours ON:		5800	>	Z952	
AHUS Hp:_		4.75		4.25	
cfm:		16.7 K		16.7 K	
Min Fcor	nomizer:			<u> </u>	
200.					······································
MISC:	/ 0 -	<i>m</i> 26			4 13
1-570	w/Damper	(a) 2.5 (a) 1.75		FM - Mess	
Wind	w/Damper	CLA AB B		CFIVE-WIES	S TICK U
<u> </u>	- Zper Floor		0		
	· · · · · · · · · · · · · · · · · · ·				

	JOB FT CARSON FEAR UPDATE			
	SHEET NO			
E M C ENGINEERS, INC.	CALCULATED BY ATN DATE 9			
Denver • Colorado Springs • Atlanta • Germany	CHECKED BY DATE			
P-1218	SCALE			
Controls are same a 1217				
Compressor is broken - No ma	uh aire			
2 out of 3 Mixing daupers bro	Kan (Linkages desconnected)			
Main CW Supply 2-way V 2-4" Valves				
	+ No O.A. CW condrol. Sonson			
ZU Syst. Locks OK.				
3rd FLOOP EAST MER				
NZU Syst. OV	•			
3rd PLOOP WEST MER				
3 act discommented on Mixi	2 Parpers - Replace.			
2nd Floor West MFR				
zu Syet. OK				
HEV for Kitchion. co. trals ar	e shot? Penthouse.			
ISTFUR WEST MER				
nzu syst.ok,				
BSMT MER				
Boilars are orig- Kewanee's				
It circ. purps & controls as &	me. Sysh Lock & o.K.			

****	FMEA SIMILAR BUILDI	NGS SUDVEY FOR	,	
BENERAL BUILDIN	G DATA	NOS SORVET FURN		_ (
BLDG #: 1219 (P) B SURVEYED BY DE	Non commissions LDG NAME: BARRACH RT BLDG CONTACT: 150 ACKS # FLOORS: 3 #	DATE: 200 PEOPLE: 160 BLD	Classrooms (9/92, AJN) 5-85 JOB #: 124 PHONE EXT: 4261 GARFA: \$100	
BLDG OCCUPANCY:	SMIWTHFS SMIWTHFS	0001 10 240		
T'STAT SETTING:	1110	AUTO SETBACK:	— 10/ Y: — /—	
, , ,	ure, inside, Occupied: ure, inside, Unoccupie	: <u>(45/7</u> 8 T	emp Present: 80° irChange/hR: 107	
ARCHITECTURAL			307 W. <u>LO 7</u>	
G R F S	AREA 21,428 LASS 6306 00F 18,518 LOOR 1,022 UM 69,762	U-value .288 1.176 .13	UA -6.171 -7416 -2600 879 -16.873	
Entry doors:	ng Height: 85 F1 e: Alum Wood eBelow SP DP # OH Doors: Ø	CURT Infi % of Area C	Insulated: Y/N ns: ① / N ltration L ② H onditioned: 10.0	
ELECTRICAL EQUIP:	OFFICE KW/Unit:	#Units:	Util Frac:	
DHW: TYPE: NG/ELE	C(CONV) Supply Te	emp:~ CAL /D		
MECHANICAL	AFUE: 60	2,		
Primary Syst Fuel: Capacity: est.Peak Del Months ON:	CAS FIR	.0.6	COOLING	
Hours ON: AHUS Hp: cfm: Min OA: Economi	5808 4.25 16700 1000 Zer: NO			
ISC:				
Z-HEVSG	upply heated outsi	de air to mess	zhall area	· · · · · · · · · · · · · · · · · · ·
windows	Same at Bldg 1118	West Zone suppt		16 40
HWpumps: 2 at	2HP @ Z-Z-Way STM V		lotol achietus 24V.H	~ HP
	-		TYOUTS CTYON	

, 7 C L

۸f

18888	

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

P-1219

JOB FT CARSON EEA	UPDATE		
SHEET NO.			,
CALCULATED BY AJN	DATE _	9/93	
CHECKED BY	DATE _		
COALE			

157 Sgt, Shundson. 2373 2509

30 day courses.

270 students & staff at One Time 0630pm - 10:00pm.

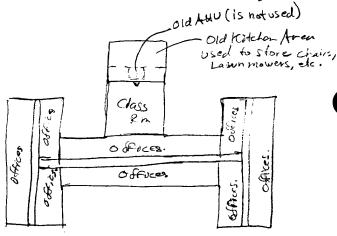
Offices on 18t. 2nd 23rd Classrooms

> Baseboard Raddation on the perimeter of the Bidg. throughout.

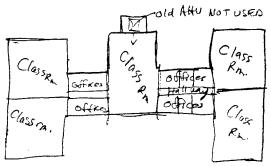
No maus in this Bldg.

All now insulation on Esiles & piping. All Acm has been abouted. Classroom Lighting 1: (38' X 26') = SF 2 TUBE 4' FLUOR. et 12 FIXS. 40WEAMPS = watts/SF for Classrooms.

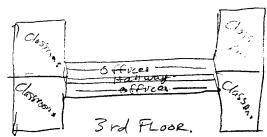
Lighting is recessed in new grad ceiling. (N 8" air space)



1ST FLOOR



2nd FLOOR



****	FMEA SIMIL	AR BUILDI	NGS SURVEY	FORM	****
RAL BUILDI	NG DATA	LDC Prin	nary Leadership	Development	Class rooms,
BLDG #: <u>/220</u> P/ SURVEYED BY: PK BLDG USE: <u>RARR</u>	HOT BLDG CO	INTACT: F	PIPIFY	TELEPHONE	JOB #: 124 EXT: 5933 A: 51800 SF
BLDG OCCUPANCY	: SMTW	Th F S	0001 TO TO	2400	
T'STAT SETTING		76	AUTO SETBA	.CK: N / Y	': <u>-</u> /_
Temperature,Fu Temperature,Fu	ture, inside	Occupied	: <u>65/78</u> ed: <u>55/-</u>		resent: <u>80'</u> inge/hR: <u>1.07</u>
ARCHITECTURAL		AREA	U-valu	ıe	U A
	WALL Z	6306	1.176		17/
	ROOF	18,518	.13		167 379
		69,762			873
Avg. Floor-Cei dow frame t low size: # intry doors:	ype: Alum	MOOG	operable s	sections:	① / N
	•				
LIGHTING: Type					
ELECTRICAL EQU	IP:OFFICE				
DHW: TYPE: NG/	ELECTONY	Supply AFUE: <u>6</u>		GAL/Pers	son-Day:
MECHANICAL			TING		OLING
Primary S Fuel:	ystem:	2-BOILER GAS FIRE	0	199 CCE	2
Capacity: est.Peak	Del.Effic:	2871MBH	INPUT (EA.)	52.19	2/2
Months ON	l:	8		4 2957	
Hours ON: AHUS Hp:		5808	<u> </u>	4.75	
cfm:		16,700		16,70	
Min Econ	OA: nomizer:	100%			
MISC:	·				
	Us; 2 per F	loor,			
.					·

PAGE 1

of 1

إ	
باستر	933 88 338
1	

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

P-1220

JOB FT CARSON	EEAP UPDLITE	•		
SHEET NO.		. OF		
CALCULATED BY AJN		DATE	9/92	-
CHECKED BY		DATE		

MER

2 steam conventors

- . I for West Zone
- · I for East Zone

HWPump No.1. serves West Zone. " " No.2. serves East Zone.

HUPump No. 1 is new:
Bell & Gossell No. 312T
1/2 HP Marshan
208-730/460 V.
418-4.8/2.4 A.

Pump. No. 2 is 1/2 Hp.

Basis Convertor Configuration

The Resonant Configuration

O.A. Sensor

Controls?

Boiler

Valve

Control 1 set at 105°F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050-F

1050

All asbertos abouted from MER.

Cord-Rumps: Zat/ZHF and Buldon

Boilers are original Kalvanoc's Bldg. Hallways are 0.5 watts/SF (Fluor)

All Three Floors are used as Barracks.

6 M 20's in Bldg. all are Turned OFF.

1 STAR Middle Classroom has new grid ceiling & Floor. Lights.

Blog. is well Kept up. Most of Bldg. is original survey.

Old Kitchen Mess is locked; is not used for storage.

New DHW Acuta heats water to , torage tank.

**** F	MEA SIMILAR BUILDI	NGS SURVEY FORM	(9/92)	
HERAL BUILDING			AJN	
BLDG #: 1363(P)BL SURVEYED BY: BLDG USE: BARRAC	DG NAME: BK W/O ME BLDG CONTACT: KS # FLOORS: 3.1 #	DATE: 2-13 TELEF PEOPLE: BLDG	-85 JOB #: 124 PHONE EXT: G AREA: 40639 SF	
BLDG OCCUPANCY:	SMTWThFS SMTWThFS	0001 TO 2400	<u> </u>	
T'STAT SETTING:	HTG: 76/ -	AUTO SETBACK:) / Y: <u>/_</u>	
Temperature, Futu	CLG:/ re,inside,Occupied re,inside,Unoccupi		emp Present: 76 rChange/hR: 1.07	
ARCHITECTURAL	4054	U walua) (A	
	AREA 16,046	<u> </u>	UA 2,583	
	LASS 4(414) 00F 13509	1.176-0.568	5.191	
F	LOOR 13,509	0.25	3,377	
	UM47,478		12,367	
Avg. Floor-Ceili ndow frame typ idow size: <u>So</u> Entry doors:	ng Height: 8' F e: Alum Wood e Dow SR DP # OH Doors: #	loor type: <u>('/wwl)A</u> Operable section CURT Infi 5 % of Area (meInsulated: Y/N/ ons: Y / N ondition L M H	(
	Fluorescent			
ELECTRICAL EQUIP	: KW/Unit:_	#Units:	Util Frac:	
DHW: TYPE: NG/EL	ECACONY Supply AFUE: 6	Γemp: <u>~ \ 5</u> ∅ .GAL/ 3.1 %	Person-Day:	
MECHANICAL .	HEA.	TING	COOLING	
Primary Sys	tem: <u>HTHW</u> →	HW CONV.	NONE	
Fuel: Capacity:	التناز الشراك فيجهب وينصوصون	CP) KBTUH		
est.Peak De	1.Effic: 63.1°	<u> </u>		
Months ON:_ Hours ON:_	<u>වි</u> 5809			
AHUs Hp:	15			
cfm: Min OA		KCFM		
Econom				
MISC:			•	
· I-CONVERTO	R-1905MBH	•	,	
· Z- EF's a		ea - 32"x53"		(
			11-	
6 - 15	ownt extens lan	ps on 12 hr	3/day (avg)	
			/	

PAGE L of L

E M C ENGINEERS, INC.

JOB FT CARSON EELP	UPDATE	_
SHEET NO.	<u> </u>	_
CALCULATED BY AJN	DATE 9/92	_
CHECKED BY	DATE	
SCALE		_

BLDG. P-1363

HW RADIATION ZONE PUMPS

PUMP#1: IHP BALDOR MOTOR

PUMP #2: NEW B&G pump -2HP MARATHON MOTOR BLOG. WAS DOUBLE PANE WINDOWS, ALUM, VERTICAL

ARCHITECTURAL CHANGES

SLIDERS.

2 RADIATION ZONES

ZNI HTG VALVE IS 2" PNEUMATIC.

HTHW CONTROL VALUE IS A
1 1/2" PNEUMATIC

· SETPTS AT BOOF & 55°F.

AHU (NORTHEND)

- . 15 HP MOTOR
- . SMART ECONOMIZER SET PT. AT 70°F.
- FAN MOTOR CUT OUT SETPT. AT 70°F. WHEN ABOVE 70°F, FAN WILL RUN.
- ALL DAMPER ACTUATORS ARE HONEYWELL MODUTROL ACTUATORS.
- NO MIXED AIR CONTROL SETPT.
 EITHER ALL O.A. OR R.A. DEPENDS ON
 SMART ECONOMIZER.
- " CW COIL VALVE IS A TWO-WAY, SIZE IS 2". RESETS FROM DISCHARGE AIR TEMP. & O.A. TEMP.

	***	FMEA SIMILA	R BUILDI	NGS SURVEY FO	ORM	****
<u> </u>	AL BUILDI	NG DATA				(9/92 AJN)
CHOVE	VED DV.	BLDG NAME: <u>BL</u> BLDG CO <u>PACKS</u> # FLO	NTAPT.	Ti		- X 1 *
BLDG	OCCUPANCY	SMTWT	h F S h F S	0001 10 5	400	
T'STA	T SETTING	: HTG: 76/		AUTO SETBACE	(: (N) / Y	: <u>/_</u>
Tempe Tempe	rature,Fu rature,Fu	ture, inside, ture, inside,	Occupied	: <i><u>65/-</u> ed:<u>55</u>/-</i>	Temp Pr AirCha	resent: 76 nge/hR: <u>1.07</u>
ARCHI	TECTURAL					•
		WALL 1	AREA	<u>U-value</u>		UA 583
	<i>.</i>	GLASS 4				
	•	ROOF 13	3509	1.090		16
			,509	0.25	<u> </u>	377
			, 689			
ำ ำ ำ ๓ ๓	ow trame t	ling Height: ype: Alum oc Below 9	WOOd	uperable sed	ctions:	/ N
	`	•				_
		: Fluorescen				•
ELECT	TRICAL EQU	IP: K	W/Unit:_	#Units:_	Uti	Frac:
DHW:	TYPE: NG/	ELECKONY	Supply AFUE:	Temp: <u>~ \5</u> 0	GAL/Pers	on-Day:
MECH!	NICAL				000	***
	Primary S	vetom.		TING HW CONV.		ING
	Fuel:	ystem.	Nag (200E
	Capacity:			KBTUH		
		Del.Effic:	63.7	%		
	Months ON Hours ON:		580	<u>a.</u>		
AHUs	Hp:		- 7 200	· · ·		
	cfm:		~ 190 ·	KCFM		
	Min		700%			
	Econ	omizer:	_ <i>NO</i> _		-	
MISC	<u>:</u>					
		RTOR - 1905	BH			
/ E •	Z- EF'S	375 HP/19.	3 KCFM	ea		
•	184 W;	ndows - 424 x	<i>53"</i>	-		· · ·
	(150 watt	exterior	lights, or	12 hs	Lu (ava)
		JU WALL	KX 10(10)			
				V		

	JOB FT CARSON EEAP UP PHE					
	SHEET NO.	OF				
S, INC.	CALCULATED BY AJJU.	DATE 9/92				
lanta • Germany	CHECKED BY					

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

P-1364

Exh Fun Rm is under Water N 4" deep.

No AHU for cooling.

IHP pump Motors - 200

Same. Validis. contrils

2" Zone Valves Rad. Prior.

Marathon Exh. Fan motor
15 HP (North End MER)
(Only equip-presont)

Windows are Dbl. Pane, Vert. Sliders, Alum. Acm in MER.

***	FMEA SIMI	LAR BUILDI	NGS SURVEY	FORM	****	
ZRAL BUIL	DING DATA				59/92	
					AJN	
LDG #:13651	(P)BLDG NAME:	BK W/O ME	ESS DATE:	2-13-85	JOB #:124	
UNILILD DI.	שנשם ו	CUNIACI:		IELEPHUN	IL EXI:	
LDG USE: BAF	RACKS # F	LOORS: <u>3.1</u> #	PEOPLE:	BLDG AR	EA:40639 SF	
LDG OCCUPAN	CY: SMTW	ThEC	2021 TO	0400		
EDG OCCOLAN		Th F S	0001 TO	400		
	5 x	5				
'STAT SETTII	NG: HTG: 76	/ —	AUTO SETBA	CK: (N) /	Y: - /-	
	CLG: —	/=		•		•
emperature,	future, inside	e,Occupied	: <u>65/-</u>	Temp	Present: 76	
emperature,	Future, inside	e,Unoccupi	ed: <u>55/-</u>	AirCh	ange/hR: <u>1.07</u>	
RCHITECTURAL	•					
KONTILCIONAL	•	AREÁ	U-valu	•	UA	
, Y	WALL	16,046	161		5.83	
	GLASS	4,414	1.176 0.	568 - 5	191	•
	ROOF	13509.	1090	<u> </u>	216	•
	FLOOR	13,509	0.25		3,277	
	SUM	34,689			367	
us Elsan Ca				. **		
vg. ridor-ce 'dow frame	type: Alun	5 8 F	loor type:	and Space In	sulated: Y/N)
	Soe Below				T/N ation LMH	
Entry doors	# 01	Doors: #	2 of A	rea Cond	itioned:	
		. 500.5	2 0. A.	- Cu Cond	Teronea.	
IGHTING: Typ	e: Fluoresce	ent	Watts/SF:	57 Ut	il Frac:	
ECTOTOAL FO						
ECTRICAL EQ	Inth:	KW/Unit:	#Units:	Ut	il Frac:	
HW: TYPE: NG	/FLECKONY	Sunnly	Tamp :~ 1 500	CAL /Dom	can Dave	
	7 2220,0011	الط عادة المحادثة المحادثة المحادثة المحادثة المحادثة المحادثة المحادثة المحادثة المحادثة المحادثة المحادثة الم	Temp: ~ 150	GAL/PEP	son-pay:	
CHANICAL		02. <u>vo</u>	211 _2			
		HEAT	TING'	CO	OLING	
Primary	System:	+THM→			ONE	
Fuel:		Nag (<u>(6)</u>			
Capacity	Del.Effic:	1905	KETUH			
Months O			/			
Hours ON		<u> </u>				
lUs Hp:	·	<u>-5208</u>	<u> </u>			
cfm		~ 190	KCFM			
	0A:	700%	PCF IVI			
	nomizer:	110				
	\widetilde{R}					
SC:	(3)					
· I.CONVE	RTOR - 1905A					•
· Z- EF's		3.3 KCFM E	²a			
" <u>184 W</u>		X53"				
2-2HP	1570	arathon, motor				
T 145	150 watt	exterior	langs; on	12 hn/	dry (arg)	
<u>Johnso</u>	n Presmatic (anth(s	,		<i>'</i> 0'	

PAGE L of L

	***	FMEA	SIMILAR	BUILDI	NGS SURVEY	FORM	***	~
	RAL BUILDI					•	X 42	,
SURVE	EYED BY:	В	LDG CON	TACT:		TELEPI	45 JOB #: IONE EXT: AREA:4063	
BLDG	OCCUPANCY	: <u>S</u> M	T W Th	F S	0001 TO	2400	- -	
T'ST	AT SETTING	: HTG:	<u> 16/-</u>	_	AUTO SETB	ACK: (N)	/ Y:	<u> </u>
Tempe Tempe	erature,Fu erature,Fu	ture,i	nside,0	ccupied:	45/- d:557-	· Ter Aiı	np Present: rChange/hR:	76 1.07
ARCHI	TECTURAL							
•		WALL		AREA 046	<u>U-val</u>		2,583	
		GLASS		414				
		ROOF		5 <u>0</u> 9	.090		1,216	
		FLOOR SUM_	<u> 13,</u> 34,	509 689	0.25		3,377	
Ava.	Floor-Cei	 lina H	 eight:	2' F1	oor type:	رام الم	Insulated:	
ndo	ow frame to	VDe:	(Alum)	1000	Operable	Section	15: Y / N	
Ocn t	ow size: <u>{</u> try doors:	<u>oe</u> 130	# OH D	ors: 6	CURT % of	Infil Area Co	tration londitioned:	. м н
LIGHT	TING: Type	: Fluo	rescent		Watts/SF:	<u>10.</u>	Util Frac:	
ELECT	TRICAL EQU	[P:	KW	/Unit:	#Unit	s:	Util Frac:	
DHW:	TYPE: NG/	ELECK				S GAL/F	erson-Day:	
MECHA	ANICAL		•	<u>ط</u> : FUE)				
	Primary Sy	vctem.		ТАЗН <i>I ←ЫНТН</i>			NONE	
	Fuel:	, 3 00		Nag	(P)		<u> 1001018</u>	
	Capacity:			1905	KBTUH			
	est.Peak 1 Months ON		tic: _	63.7%	<u>/</u>	 		
	Hours ON:	•		580F	2			
AHUs	Hp:			15				
	cfm:	2.4	<u> </u>	100	KCFM			
	Min 7 Econ	omi <u>zer</u>	<u> </u>	700%				
MISC:		, ,	15 3.		•			
•	1.CONVER	TOR- I	905MB	Н				
	Z-EF'SG	075 F	19.3	KCFM &	' a			
		rdaws	424 XS		is/High Effic	3		
_		43; 14 -150	watt		- leurs on	17 h	I day 1 said	2
					7/		1 100	

***	FMEA SIM	ILAR BUILDI	NGS SURVEY	FORM	***	
ZRAL BUIL			,		(9/92 (AJN)	
BLDG #: 1367 SURVEYED BY: BLDG USE: BAR	727	OUNIACI.		1 F) F F 7 1 1 1 N F	JOB #:124	
BLDG OCCUPAN	CY: SMT V	Th F S	0001 TO	2400		
T'STAT SETTI	NG: HTG: 76	/	AUTO SETBA	CK: (N) / Y	': <u>/_</u>	_
Temperature, Temperature,	CLG: — Future,insid Future,insid	e.Occupied	: <i><u>65/-</u></i> ed: <u>55/-</u>	Temp P AirCha	resent: 76 nge/hR: 1.0	<u>.</u> 7
ARCHITECTURAL	.					
	WALL GLASS ROOF FLOOR SUM	AREA 16,046 4,414 13,509 13,509 34,689	U-valu 161 1-176-8 .090 .0.25	2, 0,568 Sj	UA 583 191 1,216 1,377 367	- - - -
intry doors	Soe Selow # 0	H Doors:	Operable so CURT 5 % of Ai	ections: Infiltra rea Condi	Y / N tion L M H tioned:	
LIGHTING: Typ						_
ELECTRICAL EQ			#Units:	Uti	1 Frac:	-
OHW: TYPE: NG	/EFEC (CONA)	Supply 1 AFUE: <u></u>	Temp: <u>~15</u> 8	GAL/Pers	on-Day:	<u>-</u>
MECHANICAL		HEAT		C0.01	TNC	
Months O	Del.Effic:	1905 1905 1905	HW CONV. CP) KBTUH		LING	•
Hours ON AHUs Hp:	•	<u> 5808</u>	<u> </u>			-
cfm ^{Min}	:		KCFM			
	nomizer:	<u> </u>				-
MISC:	VISHP)	•				•
	RIOR 1905					
• Z- EF'S		8.3 KCFM e	'a			. (
2 HW pu) 19t 1/2H	ρ.	· · · · · · · · · · · · · · · · · · ·	_// = \	•
Johnson	150 watt	exterior	loups, on	12 h13	/dry (aug)	
	I ricomatic Co	sorres			7 - 0	

**** FMEA SIN	MILAR BUILDINGS SURVEY FORM	***
ZRAL BUILDING DATA		(9/92) AJN
BLDG #: 1664PBLDG NAME SURVEYED BY: BLDG BLDG USE: BARRACKS #	E:BK WO MESS DATE: 2-13-85 JO G CONTACT: TELEPHONE E FLOORS:3.1 # PEOPLE: BLDG AREA:	IB #: 124
BLDG OCCUPANCY: SMT	W Th F S 0001 TO 2400 TO	
T'STAT SETTING: HTG: 76	AUTO SETBACK: (N) / Y:	<u>/</u>
Temperature, Future, insi	ide,Occupied: <u>65/-</u> Temp Pre ide,Unoccupied: <u>55/-</u> AirChang	sent: <u>76</u> e/hR: <u>1,07</u>
ARCHITECTURAL	4074	
WALL	16,046 .161 2,58	
GLASS ROOF	<u>4,414</u> 1.176 5,19 13509, .090 121	
FLOOR SUM	13,509 0,25 3,3 34,689 — 12,3	7
Ava. Floor-Ceiling Heig		
dow frame type: Al	tht: 8' Floor type: Consulting Wood Operable sections: Y SP DP CURT Infiltrati OH Doors: 6 % of Area Conditi	/ N
entry doors: #	OH Doors: 65 % of Area Conditi	oned:
	cent Watts/SF: .57 Util	
ELECTRICAL EQUIP:	KW/Unit:#Units:Util	Frac:
DHW: TYPE: NG/ELEC/CONY		-Day:
MECHANICAL	AFUE: 63.1 %	
Primary System:	HEATING COOLI HTHW→ HW Conv: NON	
Fuel:	Nag (CP)	
Capacity: est.Peak Del.Effic	1905 KBTUH	
Months ON:	8	
Hours ON:	5808	
AHUS Hp: cfm:	~190 KCEM	
Min OA:	100% KCFM	
Economizer:		
MISC: 15	o	-
· I.CONVERTOR 190	SMBH	
• Z- EF'S (375 HP/	19.3 KCFM PA	
- 134 Windows 4	2"XS3" (original windows)	7
6-150 wat	+ exterior lames, on 12 hold	dus (eng)
2 HW Pumps - 1 HP	@. Preumetic Controls.	2.07

***	FMEA SIMIL	AR BUILDIN	IGS SURVEY I	FORM	***
.AL BUILDI	NG DATA				(9/92)
BLDG #: 1665(P)	BLDG NAME: R	KS W/O MI	=SS DATF:∴	212-49	AJN AJN
SOULTED DITE	BLUG CO	JNIACI:		LELEPHONE	EXT:
BLDG USE: RAR	RACKS # FLO	0085: <u>31</u> #	PEOPLE:	BLDG AREA	1:40639 SF
BLDG OCCUPANCY		Th F S Th F S	0001 TO 3	2400	
T'STAT SETTING			AUTO SETBAC	K: (N) / Y:	—/—
Temperature, Fu	CLG: 75/	Occupied.	651-	Temp Pr	esent: 7
Temperature, Fu	ture, inside,	Unoccupie	d: <u>55/-</u>	AirChan	ge/hR: 1.07
ARCHITECTURAL					÷ .
≯ ∞.	WALL /	AREA 6,046	U-value		UA
	GLASS Z	4,414	1.176	5,7	91
		3,509 3,509	0,25	$\frac{1}{3}$	216
		4,689		12 3	62
Ayg. Floor-Cei	ling He <u>ight</u> :	์ g' F1	oor type:	Janu Insu	lated: Y/60
V 'ow frame ty Dw size:	ype:M.Iumi	BOOM	Uperable se	ctions: ly	1 / N
fortry doors:	8 # OH	Doors: &	S of Ar	ea Condit	ion LTM H ioned:
LIGHTING: Type:	·				
ELECTRICAL EQUI				-	
DHW: TYPE: 'E	LECCONV	Supply To	emp:140°	GAL/Perso	n-Day:
MECHANICAL		AFUE: 63	<u></u> 2		
Primary Sy	(<u>C</u> † 0 m ·	HEAT		COOL	ING
Fuel:	, s ceni	HTHW > HI	M COUN.	Nag (10
Capacity: est.Peak D	A FFFE	2350 E	BTUH		
Months ON:		63.1%	<u> </u>	52.12	2%
Hours ON:_ AHUs Hp:		5808		2952	
cfm:				<u>300</u> 71400	
Min O				30%	
Econo	omizer:				
MISC:					
	TOR·2350MI Ndows - 42"x	7,	-2 / 22 / -	Υ	
			givel windows		
6-	150 wast	- lamps o	4 12/13/d	oy (aug)	
2 HWP		High Efficien	cy Motors @) ·	

	***	FMEA SIMIL	AR BUILDI	NGS SURVEY	FORM	****	
GE	AL BUILDIN	NG DATA				(9/92) AJN	
BLDG SURVE BLDG	#: 1666(P)E YED BY: R USE: RARI	BLDG NAME: B F BLDG C RACKS # FL	KS W/O M ONTACT: OORS:31 #	ESS DATE: PEOPLE:	Z-13-85 TELEPHON BLDG AR	JOB #: 12.4 E EXT: EA:40639 SF	
BLDG	OCCUPANCY:	SMTW	Th F S Th F S	0001 TO 10	2400	*	
T'STA	AT SETTING:	: HTG: 72/		AUTO SETBA	CK: (N) /	Y:/	
Tempe Tempe	erature,Futerature,Fut	ture, inside ture, inside	Occupied	: <u>65/-</u> ed: <u>55/-</u>	Temp AirCh	Present: <u>76</u> ange/hR: <u>1.07</u>	
	I TECTURAL	GLASS I ROOF I FLOOR I	AREA 6,046 4,414 3509 3,509 4,689	U-valu .16) 1.176 .090		UA ,583 ,197 1,216 3,377 -367	
						sulated: Y/M [Y] / N Pation L[M] H litioned: 100	
						il Frac:	·
ELEC.	TRICAL EQUI	IP:OFFICE	KW/Unit:_	#Units	:: Ut	il Frac:	
DHW:	TYPE: 'I	ELEC (CONY)	Supply AFUE:(_	Temp: 140° 3.1 %	GAL/Per	son-Day:	
MECH	ANICAL				CO	OLING	
,	Primary Sy Fuel:	ystem:	+THW+	TING HW Conv. CP)	N9G CHW		
	Capacity:	Del.Effic:	7350	EBTUH %	8.7	.12%	
	Months ON		8		4		•
AUHe	Hours ON:		5808		295	<u>,2</u>	
AHUs	Hp: cfm:				<u> </u>	ØØ	
	Min			·	30		
•	Econ	omizer:				-	
MISC	:						
		TOR. Z350N	1BH z"x53#				
	6-	150 walt	exterior	larys, on	12 hs/	Day (ang)	

DACF 1 of 1

	JOB FT CARSON FEAP UP	POSTE
	SHEET NO	OF
E M C ENGINEERS, INC.	CALCULATED BY AJN	DATE 9/92
Denver • Colorado Springs • Atlanta • Germany	CHECKED BY	DATE
P-1666	SCALE	

Same Abt for cooling as surveyed in Bldg. 1363 Htg today, unable to check cooling mode controls. Abt & controls book to be ingood condition.

3HP Bell & Gossett pump on CW 15HP Fan Motors - Ztot . I AHU on North and ? Cooling Only. . I AHU on South and. S

2 zones for baseboard radiation.

- 1 - 24P HW pump (Maruthon)

. 1 - 14P HW pump (High Eff Baldon Motor)

Johnson Preconatic Controls « Same controls as P1364 . Preconatic Valves aduste.

ACM present on piping. Windows are S.P. (originals)

~ .,	***	FMEA SIM	ILAR BUILD	INGS SURVEY	FORM	****
	AL BUILDII	NG DATA				(9/92) AJN
BLDG SURVE BLDG	#: 1667(P) YED BY: R USE: RARI	BLDG NAME T BLDG RACKS #	:BKS W/O N CONTACT: FLOORS:31	PEOPLE:	TELEPHONE BLDG ARE	JOB #: 124 EXT: A:40639 SF
BLDG	OCCUPANCY	SMT	W Th F S W Th F S	0 001 TO	2400	
		CL6: 70	5/—	AUTO SETBA 1: <u>65/-</u> ied: <u>55/-</u>		resent: 76 inge/hR: 1.07
	ITECTURAL	·	AREA	U-valu		UA
	•	FLOOR SUM	16,046 4',414 13509 13',509 34',689	.161 1.176 .090 0.25		.583 .191 2.16: .377 .367
Avg.	Floor-Cei ow frame t w size: <u>C</u> try doors:	ling Heig ype: Al ee Below 8	ht: g' i um Wood SP DP OH Doors:_	Floor type:_ Operable s CURT	Ins ections: Infiltra rea Condi	sulated: Y/N Y / N ation L M H itioned: 100
LIGH	TING: Type	:Fluores	cent	Watts/SF:_	5 Uti	il Frac:
ELEC	TRICAL EQU	ip:office	KW/Unit:	#Units	: Uti	il Frac:
		ELEC CONV		Temp: 140°	GAL/Pers	son-Day:
MECH	ANICAL		. —	ATING		DLING
AHUs	Primary S. Fuel: Capacity: est.Peak Months ON Hours ON: Hp: cfm:	Del.Effic :	HTHW→ NeG (Z350	HW CONV. CP) EBTUH	CHW NOG 52. 4 295; 300 7140	(CP) 12% 2
	Min Econ	OA: omizer:				<u></u>
MISC	1- CONVER 134 W	TOR. 235 Moows 42	14 X53"	- lomps, c	on Izhas	/dry (arg)

سميم	
333	
V	

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • Germany

P-1667

JOB	
	OF
CALCULATED BY AJN	DATE <u>9/92</u>
CHECKED BY	DATE
SCALE	

Same as 1666 except:

- · 10 HP Fan motor on AHU (Douth MER)
- 5 HP CW pumps (2) South MER is filled with Steam to the point of Zero Visibility. • major steam leak.

Energy Monotorong hardware in South MER; similar to P-1363 Windows are S.P. (originals)

*** FMEA_SURVEY_OBSERVATIONS***
9/92
GENERAL BUILDING DATA (ASN/JOE)
BLDG #: P-1227 BLDG NAME: DON'T CLINIC JOB #: 124 SURVEYED BY: RWW/RT DATE: ACV STAPER CONTACT TELEPHONE NUMBER: X 5617 BLDG USAGE: Deate(Cave TOT BLDG AREA: 15,600 SF # OF FLOORS: # OF PEOPLE: 42 + patients
BUILDING OCCUPANCY: MON - FRI: 0715 TO 1600 FIRST SHIFT: SATURDAY: TO SECND SHIFT: SUNDAY: THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
ENVIRONMENTAL CONDITIONS: HEATING SETFOINTS COOLING SETFOINTS
WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 72 72 72 72 72 72 72 72 REQUIRED T'STAT: 68 55 55 78 THERMOSTAT LOCATION(S): HONYWELS HUMIDIFICATION REQUIREMENTS (RH): April 40% H'STAT LOCATION(S): RACACT
LIGHTING: AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE 1.56 ON 0715 OFF 1600 ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF SEE ATTACHED SCHEDULE? X Y N page 3
ELECTRIC EQUIPMENT: AREA (SF) TYPE AREA (SF) TYPE AND TYPE AND THE SCHEDULE AND
INTERNAL MASS: MATERIAL: CAMPRANT PARTONS ESTIMATED MASS: _ (L. M) H)
INFILTRATION: LOCATION(S): Vestibule (Mrn entrance) saves much energy by Keeping out militation. Building is slightly personnized. ZNI ZNI
ESTIMATED RATE:(L, M, H) or
Assume No Miltration due to pressuritation and use of vestibules.

GENERAL BUILDING DATA		NET		
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT NEM: Brick and/or emcrete, 3/2" SE 8: bott iou, Gyp bod SW E:	WIDTH HEIGHT 143 107/865 9/5.5 143 109/885 9/5.5	NET 1028 1028 -1298 -1155 -1346	0.071 0.071 0.071 0.071	
ROOFS: CONSTRUCTION COMPONENT INT. 7N BIT up roof, 3" Rigid Ms, EXT. 7N 3 D. Coocrete, air space, EXT. 7N Suspended ceiling EXT. 7N EXT. 7N EXT. 7N	WIDTH HEIGHT 95 68 143 20.5 143 20.5 68 27 68 21	AREA (SF) <u>6,460</u> <u>2,931.5</u> <u>1,836</u> 1,428	U-VALUE 0.09 0.09 0.09 0.09	
SE 9: 170 (1) SW Z: 132 (1) NW M: 122 (1) HORIZ: 198 FLOOR TYPE: SLAB X CRAWL AREA: 6460 SF (Located under	SPACE BASEMEN u intuitor zoné)	DRAPES DRAPES DRAPES OTHE	U= 0.5 U= 0.5 	LB
PERIMETER: 504 LF INSULATION	17 <u>X</u> Y_NIN	2"		
SPECIAL AREAS:				
ADDITIONAL NOTES: T'Stats are	single setpoi	ut, excep	Tone	
T'S at # 3 - 68 F, #4-	680 Foutside	North		
Day - 69/ Night 64 In N	W corner - s	etback.	1-stat	-
#2 - 67° In treatment are	a (too hot) ceu	iter of l	<u>oldg.</u>	-
4 bunsen burners in fabrica	etion lab. The		pace is	<u>.</u>
heated by the Mechanical Room,	therefor assure	no floor	et loss.	
FILM #: FRAME #: SKETCHES: FRAME #: SEE PO	rge 4 of 12	tats wer	e set la	ω
man afferypt	by the occupan	to to ob	tain cooli	<i>Y</i> g.
However, during	the survey the former that of	L scripant	3 maintain	
a 72°F space to	inperature (for heating	and cooling) during Also three	clock
* Specify in "Additional Notes" Bldg No.: _ P-1227_	in MER Co	ntrol pand	I was fou	
Bldg No.: _ P-1227_	be mopera	Time (pins a	7 -= 17.	. 5
		Pade	— OT 12	

*** FMEA_SURVEY_OBSERVATIONS__***

GENERAL_BUILDING_DATA

LIGHT	ING SCHED	ULE						۲ag	∍of	
AREA:	(A) MAIN_ (A)	x	SF		(B) MEZZ_	x		SF -		
DATA S	source: X	, _DRAWING	ss	URVEY	TOUR					
Mark ¦	#lamps	: W/Fix 76	#Fix 62	; F1	r # 	4,712	Commer wett	nts L	=NZ(Ext	(
MW (mid)	fluo.	76	31	¦ 	; 	2,356	watts		ZNZ (Ext	-)
	fluo.						_			•
NE	flro-	1 76	169	: 		5,244	walt	ž	器N2(Ext)
NE	Macuny	120	16	!		1,920	walls	(Record)	2N2 (Ex	<u>t</u>)
1	·		:							_
		!	1	:	;					
		!	1	:	!					_
		1	1							-
		!	:	;	1					-
		!	!	:	:					-
. :		!	1	:	!					-
		1	:	:	!					-
	 	!	1	:	1					-
		!	:		·					-
			·							-
N S)	1) FAL:	3,072	Wat	 -	6460		SF=_	2.02	W/SF	-
(B) TOT	Z) TAL:14	, 232	Wat	ts/	9127		_SF=_	1.56	W/SF	
	דחוא ובאחז									

Bldg No.: P-1227

*** FMEA SURVEY OBSERVATIONS ***

GENERAL BUILDING DATA
MISCELLANEOUS BASE LOADS: DOMESTIC HOT WATER: MANUFACTURER & MODEL 2 - Pheem Fury 2/75 gal. FUEL SOURCE WAT GAS ELEC OIL STM GEN OTHER* SUPPLY TEMPERATURE 148 'F, DISTANCE FROM HEATER 5 FT INPUT 75 K RECOVERY RATE 63.0 OPERATING SCHEDULE CONSTANT E.P.H.
TYPE NO SCHEDULE CONTROL TYPE NO SCHEDULE CONTROL TOTAL KW FUNCTION OF LIGHTS SECURITY PARKING LOT ENTRY OTHER*
ADDITIONAL COMMENTS: DHW is circulated throughout bldg
by 3/4 H.P. pump. 24 ks/day.
7
* All ext. lights operate on a photocell mounted on the root.
Individual Transformer # 308: 500 KVA, 3 Phase, Manufacturer: Standard Transformer Co., Primary & Secondary Vo Hag: 2700/12470 Y
Menufacturer: Standard Transformer Co., Pormary & Secondary Vo Has.
2700/12470 Y
FILM #: FRAME #:
ADDITIONAL SKETCHES: the Transformer Checks out OK -
No overvoltage or overloading.

* Specify in "Additional Comments"

Bldg No.: P-1227

Page 4 of 12

*** FMEA_SURVEY_OBSERVATIONS ***

MECHANICAL EQUIPMENT DATA

	HEATING PL	_ANT		
PLANT DESCRIPTION NUMBER OF UNITED MAKE & MODEL:	TS: <u> </u> 1) <u>Burnham</u> 2)	Mod.# 4FL	. 78 - 45-	LB 15 PSI
TYPE: VSTEAM	3) BOILER DIREC MHWCAST IFL ELECTRIC	RONWATER T	UBE, FIRE TU	BE
MULTIPLE UNIT O	PERATION SEQUENCE:	: _ PARALLEL		
FIRING RATE/F	UEL:#1:		#2:	
	FOWER: MFR	/ / -	A	
HOT WATER: _X_STEAM:	SUPPLY SIZE RETURN SIZE HEADER SIZE	TEMPERATUR TEMPERATUR TEMPERATUR	E PRES	SUREPSI
	Y: MAX BTUH IN _ MAX BTUH OUT_ E Mc Donald Bo DITION _ good	57 / 7/ /VI K H	gross outpu	t - 17.3 Н.Р. 597 lbs/hr.
PLANT AUXILIARI PUMPS: HW	_	A	HP HP	
FANS:	1)/_/	A	_HP @	CFM
OTHER	1)/_/	A	_HP _HP	·
COND	1)ONOFF 1)ONOFF 1)ONOFF	_ 2)ONOFF _ 2)ONOFF	3) ON_	OFF
AUXILIARY FUE	L USED: #2 OIL _	NAT GAS	S OTHER	₹

Bldg No.: 1-1227

Page 5 of 12

*** FMEA SURVEY OBSERVATIONS ***

ECHANICAL EQUIPMENT			
PERATING SCHEDULE:	DATE STARTED	15 Sep 15 May	
* PRESENT OPERATION * REQUIRED OPERATION	MON - FRI N: TO ON: TO		SUN TO TO
OTHER PLANT COMMEN	rs: Hoffman	Steam Traps	- one removed
near Air hand	ler one re	mains in D	oller voom.
Procumbi line	a3" Hz	O Honeyu	rell the
damper. Cul	ligan Uhter	Softener /	Conditioner
هنده جين هند جين هند جين جين جين جين جين هند جين هند جين هند جين هند جين هند جين هند جين هند جين هند جين جين جي			
FILM #: FRAM	E #:		
SKETCH:	•		

* --> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: P-1227

Page 6 of 12

MECHANICAL_EQUIPMENT_DATA

COOLING PLANT DATA:	
DESCRIPTION: V TRANE (DX Compress) MODEL: RAUA - 5004 - RB NUMBER: 1 TYPE: CENTRIFUGAL ABSORPTION ENERGY SOURCE: X ELEC STM HW OTHER (specify) COMPRESSOR KW AGE 1917	RECIP
CONDENSER: AIR COOLED WATER COOLED UNIT OPERATION: FARALLEL SERIES SYSTEM SERVES AHU No(s):	
COOLING TOWER DATA: MANUFACTURER: MODEL: TYFE: No. of CELLS: BLOWERS: 1)/_/ A @CFM 2)// A @CFM 3)// A @CFM DISTANCE TO COOLING TOWER FROM CHILLER	
CONTROLS & OPSEQ: When OA > 73 refree values (thus compressed) will be a control of the control	
CW TEMPERATURE: SUPPLY 'F, RETURN 'F, PIPE SIZE CNW TEMPERATURE: SUPPLY 'F, RETURN 'F, PIPE SIZE	IN
PLANT AUXILIARIES: PUMPS: CHW 1)/_ HzAHP @GPM ONOFF 2)/ HzAHP @GPM ONOFF CNW 1)/ HzAHP @GPM ONOFF 2)/_ HzAHP @GPM ONOFF	
FANS: COOLING TOWER 1)	
DATE STOPPED (5 Sep MON - FRI SAT SUN * PRESENT OPERATION: TO TO TO * REQUIRED OPERATION: TO TO TO	

* --> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: P-1227

Page 7 of 12

*** FMEA SURVEY_OBSERVATIONS _ ***

ECHANICAL EQUIPMENT DATA
OTHER PLANT COMMENTS: Compress dia: 86 RLA 396 LRA
396 LRA
15 tons
FILM #: FRAME #:
SKETCH:

Bldg No.: P-1227

Page B of 12

WECHANICAL EQUIEMENT DATA
AIR HANDLING UNITS: MANUFACTURER I VANE Climate Changermodel No. AHU NUMBER: L AHU TYPE: Multizone LOCATION: MER SPACE SERVED: Jisp.
LOCATION: MER SPACE SERVED: AISP
FAN DATA: SUPPLY FAN HP: 20 SUPPLY CFM: 19,200 STATIC PRESS: 10 RETURN FAN HP: 7 RETURN CFM: 15,215 STATIC PRESS: 10 EXHAUST FAN HP: 7 EXHAUST CFM: 15,215 STATIC PRESS: 2015 MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A DISCON
COILS: HEATING: HW _ STM X DIRECT FIRED> NG _ OIL _ ELC_ OTHER COOLING: CW _ DX X. FROM CHILLER, FROM DX UNIT REHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE HUMIDITY: STM X SPRAY _ ELC HW/CW COIL VALVES: 2 WAY, 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING 21% TO 72% R.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING 21% TO 72% E.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING 21% TO 72% ECONOMIZER: Y (Y, N), IF YES, OA S RA ENTHALPY OA LEAKAGE:
**REQUIRED OPERATION: MON - FRI SAT SUN SUN TO 2400 OOU TO 2400 OOU TO 2400 OOU TO 2400 TO TO TO TO TO TO TO TO TO TO TO TO TO
<u>HEATING SETPOINTS COOLING SETPOINTS</u> WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
*PRESENT TEMP:
SYSTEM SETPOINTS: MIXED AIR \(\sigma \) 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) T'STAT P H'STAT G COMPR G DAMPERS G LINKAGES G FANS G SHEAVES G VALVES G ACTUATORS G BELTS G MIXING BOX G OTHER
COMMENTS: Motor Frame 256T, 230 V/SYA, 460 V/27A
when OAT >65°F OA Dempers close to minimum position of 20%.
O.A. Damper Act. is Honogwell Prew. # MP 904 B 1028 B; RA. damper Act. is the same.

Bldg No.: <u>P-1227</u>

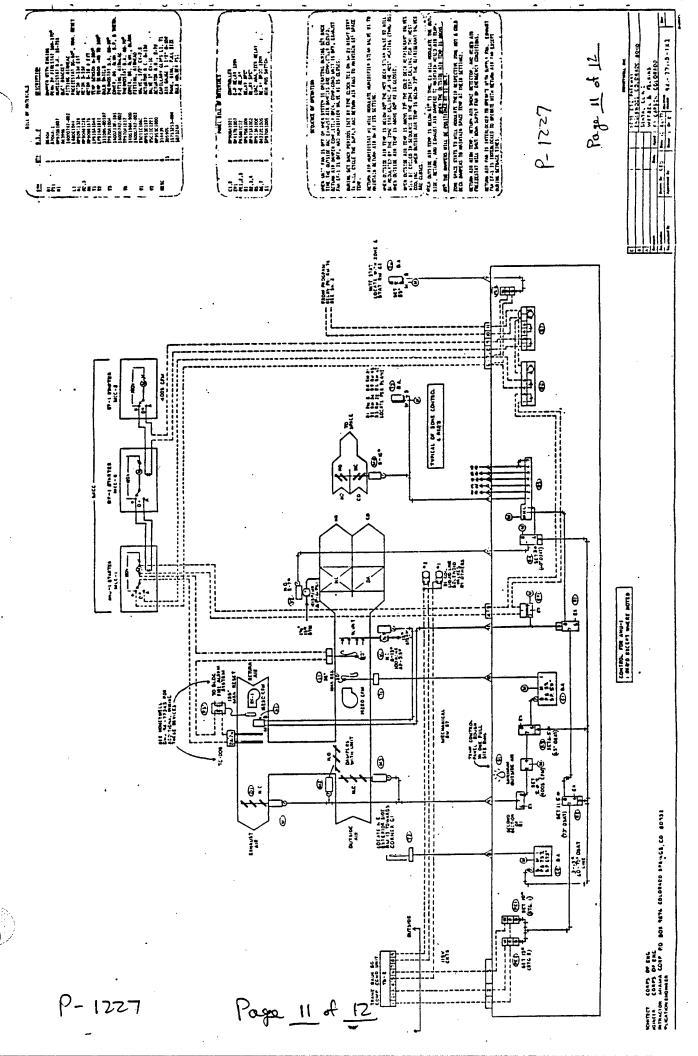
Page 9 of 12

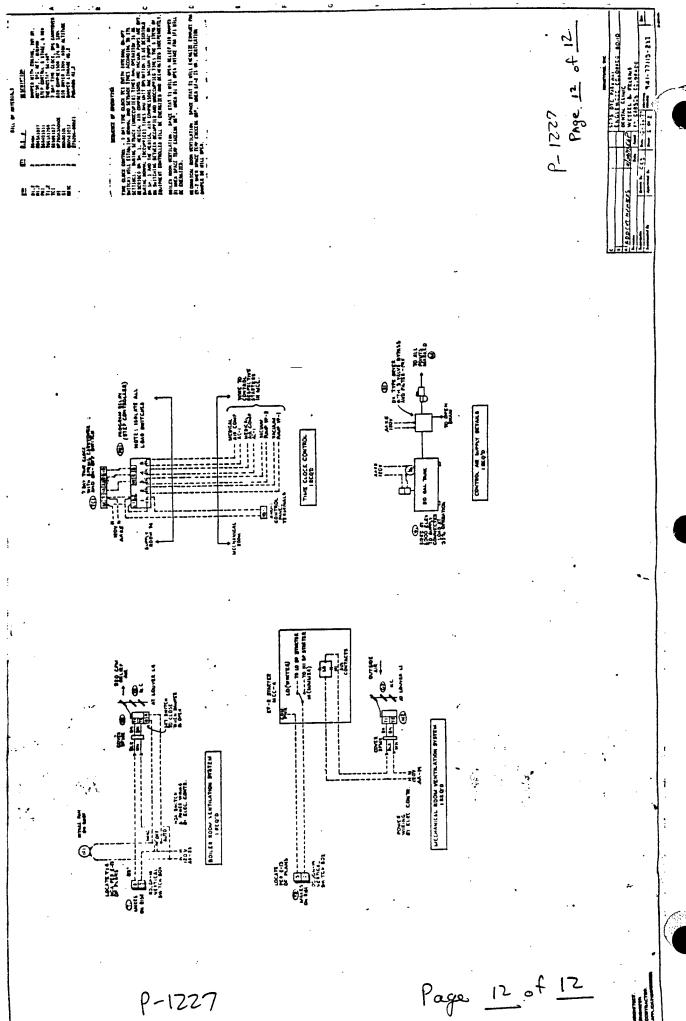
*** FMEA SURVEY OBSERVATIONS ***

MECHANICAL EQUIPMENT DATA

Bldg No.:____

CONTROL STRATEGY: See sequence of operation-control diagram. 6 zones on AHU, Act. for Mixing dampers are Horeywell Prev.
6 zones on AHU, Act. for Mixing dampers are Honeybell Prev.
MP 909 B 1676 Z 7714 All appear to be operable.
L"stm pnev. value. (z-way) on Stm coil
ADDITIONAL AHU/SYSTEM COMMENTS:
A zone reset on mixed air could be added for additional
control.
Time clock is inoperable All controls are in day modes as per note
CK service 1-8-90
FILM #: FRAME #:
SYSTEM SKETCH:





P-1227

*** FMEA_SURVEY_OBSERVATIONS__***

GENERAL BUILDING DATA
BLDG #: 1446 BLDG NAME: INDOOR POOL JOB #: 174 SURVEYED BY: 1740 DATE: 11/20/24 BLDG CONTACT: CONTACT TELEPHONE NUMBER: BLDG USAGE: RECREATION TOT BLDG AREA: 8872 SF # OF FLOORS: # OF PEOPLE:
BUILDING OCCUPANCY: MON - FRI: 0600TO 1200 FIRST SHIFT: 20 (020-09) SATURDAY: 1015 TO 1900 SECND SHIFT: 20 (100-13) SUNDAY: TO THIRD SHIFT: 10-15(ALLCT HOLIDAYS: TO HOLIDAYS:
ENVIRONMENTAL CONDITIONS: HEATING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: REQUIRED T'STAT: THERMOSTAT LOCATION(S): HUMIDIFICATION REQUIREMENTS (RH): H'STAT LOCATION(S):
LIGHTING: AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE 1) 6260 HPC 10 0.6 0N 0620 0FF 1820 2) 2612 LNC/FLR 39 0.91 0N 0FF 1820 3) ON 0FF 1820 ON 0FF 1820 DATA SOURCE: OBSERVATION ASHRAE OTHER SEE ATTACHED SCHEDULE? V N
ELECTRIC EQUIPMENT: AREA(SF) TYPE 1) Z612 WASH/DRY/SAUNA 1.2 0.46 ON Z HRS OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF DATA SOURCE: OBSERVATION ASHRAE OTHER SEE ATTACHED SCHEDULE? Y N
INTERNAL MASS: MATERIAL: WATER ESTIMATED MASS: M (L, M, H) INFILTRATION: LOCATION(S): ENTRY / LOCKER RM WINDOWS ESTIMATED RATE: (L, M, H) or 7005
-Z5 AIR CHANGES OF 626 CFM - ZONE 1

Bldg No.: 1446

Page $\frac{1}{4}$ of $\frac{8}{8}$

*** FMEA_SURVEY_OBSERVATIONS__ ***

<u>GENERAL_BUILDING_DATA</u>
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT WIDTH HEIGHT AREA (SF) U-VALUE N: 4 BRICK 4 BRICK U.5/75.5 72/9-6 1617.75 0.578 S: 1
ALOUSTICTILE 4 PATT 100:2" 88:7" 86:12 07:17 2" TEG / 15# FEU/AS SHGL 100:2" 50:6" 50:15 338
N: Ø SP DP DRAFES S: Ø SP DP DRAFES E: Ø SP DP DRAFES W: VS PROLMIL FRM SP DP DRAFES FLOOR TYPE: SLAB CRAWL SPACE BASEMENT OTHES: AREA: 8872 SF
PERIMETER: 380 LF INSULATION?Y_NIN
SPECIAL AREAS:
ADDITIONAL NOTES: ATTIC AREA VENTED BY ZEACH ZAOO CEM
EXHAUST FANS ON T-STATS - SET-POINT UNAVAILABLE.
SEE DWGS SUPPLIED FOR ADD'L INFO.
FILM #:FRAME #:
SKETCHES:

* Specify in "Additional Notes"

Bldg No.: 1446

Page Z of 8

*** FMEA SURVEY DESERVATIONS ***

GENERAL BUILDING DATA									
LIGHTING SCHEDULE Pageof									
AREA:	(A) MAIN (A)	6260) ×	SFR	20L	(B) ME:	zz <u>Z6</u> 1	<u> </u>	5F6H/LO -	K
DATA SOURCE:DRAWINGSSURVEY TOUR									
Mark	: #lamps	W/Fix	: #Fix	; F1	r # !		Comme	nts	
HPS		100	10	1 /	4 '	POOL 6	FEA L	16H1N	9
146	<u> </u>	: 60	12		<u> </u>	MMU I	LKAR	EA	
1	1 1	160	1 10	<u>'</u> 1	3_!	MEN	LKAR	EA	
INC	<u></u> L	: 75	13	1 (3!	JANTO	DR_		
1410	<u> </u>	160	-	!	B !	ENTR	; <u>Y</u>		
FLR	4	: 34	<u> </u>	!	B	ENTR	Υ		
		ŧ.	1	1	1				
	[!	:						
	!	1		: 	:				
	!	! 	!	!	!				
	1	!		!	:				
. :	!	:	!	:	!				
	!	!	1	:					
	:	1	1		ŧ				
	!	 	1	:					
(A) TO	TAL:	2000	Wat	ts/		6260	SF=_(ا عا ٥	W/SF
(B) TO	TAL:	317	Wat	ts/)	2612	SF= <u>(</u>	0.91	W/EF
ADDITIONAL NOTES:									
POOL CONTAINS (20)-150 W UNDERWATER LIGHTS									
(INC.). THESE WERE NOT ADDED IN ABOVE.									

Bldg No.: 146

GENERAL BUILDING DATE	<u> </u>
SUPPLY TEMPERATURE	
TYPE TOTAL KW	NO SCHEDULE CONTROL NO SCHEDULE CONTROL SECURITY PARKING LOT ENTRY OTHER*
ADDITIONAL COMMENTS:	
FILM #: FRAME	#:
ADDITIONAL SKETCHES:	

* Specify in "Additional Comments"

Bldg No.:____

Page 4 of 8

WECHUNICAT ERAILENT DAIH
AIR HANDLING UNITS: MANUFACTURER AHU NUMBER: AHU TYPE: DRAW-THRU LOCATION: ATTIC SPACE SERVED: POOL/SHOWERS
FAN DATA: SUPPLY FAN HP: 2 SUPPLY CFM: 14.400 STATIC PRESS: 0.30 RETURN FAN HP: 2 RETURN CFM: 5.750 STATIC PRESS: 0.515 EXHAUST FAN HP: - EXHAUST CFM: - STATIC PRESS: - DISCON
COILS: HEATING: HW _ STM / DIRECT FIRED> NG _ OIL _ ELC_ OTHER _ COOLING: CW _ DX FROM CHILLER, FROM DX UNIT REHEAT: # OF COILS TYPE, RECOOL: # OF COILS TYPE HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY, 3 WAY
DAMPERS! O.A. DAMPER: Y (Y, N), IF YES, FIXED _ %, MODULATING 35% TO 60% R.A. DAMPER: Y (Y, N), IF YES, FIXED _ %, MODULATING 0% TO 50% E.A. DAMPER: Y (Y, N), IF YES, FIXED _ %, MODULATING _ % TO _ % ECONOMIZER: N (Y, N), IF YES, OA _ RA _ ENTHALPY _ OA LEAKAGE: _ 20 % IF NO. CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRFOOR THROW-AWAY
SYSTEM OPERATION:MON - FRISATSUN*PRESENT OPERATION:TOTOTO*REGUIRED OPERATION:TOTOTO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: FNEUMATIC, ELECTRIC, FNEUMATIC/ELEC Barbor-Colman
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT H'STAT COMPR DAMPERS LINKAGES FANS SHEAVES VALVES ACTUATORS BELTS MIXING BOX OTHER
COMMENTS: HEATING COLL CAPACITY = 950 MBH @ 61.5° FRISE,
515 FPM FACE VELOCITY. AHU Fan Belt Loose; Fan not turning.
O.A./R.A idampor actuator - Type A; R.A. Sensor set at 84°F. HTG COIL HALVE & OPIZ LOK

Bldg No.: 1446

Page <u>5</u>of <u>8</u>

MECHANICA	L_EQUIPM	ENT_DATA			•		
EXHAUST F	ANS:					STARTER	
UNIT NO.	TYPE			CFM	5	& CONTROL	SETPOINT
	ROOF	MEN'S L	OCKER	SZØ	-22	AUTOW/AHU	
	ROOF	MEN'S	IOILET_	375_	20	ALTO W/AHU	
3	ROOF	WOMEN!	STOILEI	460	.35	<u>AUTOWAHU</u>	
4	ROOF	MOMEN'	LOCKER	100	.20	ALTON/AHU	
5	SEE	AHU-L DA	ATA SHE	EI	****		
	PROP	ATTIC_YE	NT	2400	.20	AUTO N/STAT	
7	PROP	ATTICY	ENT	2400	.20	AUTOW/STAT	
							·
						:	
						<u>-</u>	
NOTE: 41	L FALL	EXCEPT	Nº 5 E	QUIPPE	0 W/	GRAVITY DA	MPERS.
- POOL	HEATING	GYGTEU	HE.	wau	(EAK)	NG	
			~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	<u> </u>		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	
							.
FILM #:							
. do mand () 21 M						90 AND AND AND AND AND AND AND AND AND AND	

NOTES: TYPE --> propeller, centrifugal, etc.

STARTER & CONTROL --> momentary, maintained, line v stat, 24 v stat. self contained, etc.

Bldg No.: 1446

Page 6 of 8

MECHANICAL_EQUIPMENT_DATA .
HEATING PLANT PLANT DESCRIPTION: NUMBER OF UNITS: Z MAKE & MODEL: 1) KEWANEE M-265-KG 2) KEWANEE M-95-KG
EQUIPMENT: BOILER DIRECT FIRED STEAM CONV TYPE: STEAM HW CAST IRON WATER TUBE, FIRE TUBE FUEL: NAT GAS ELECTRIC OIL OTHER
MULTIPLE UNIT OPERATION SEQUENCE: * SERIES PARALLEL
BURNER STAGES:
FIRING RATE/FUEL: #1: 108+3313 MBH #2: 725+1188 MBH
BURNER TYPE: / POWER: MFR KEKANEE MOD No.1) KFL 5-76-6 2) 6FE K BLOWER 208/3/60-664 LYZ HP @ 6FM CONTRL 110/1/60-1_4 MOD No
HOT WATER: SUPPLY SIZE TEMPERATURE PRESSURE PSI TEMPERATURE PRESSURE PSI TEMPERATURE PRESSURE PSI TEMPERATURE PRESSURE PSI TEMPERATURE PRESSURE PSI
RATED CAPACITY: MAX BYOH IN $\frac{1}{33}$ $\frac{2}{250}$ $\frac{2}{2}$ $\frac{188}{950}$
CONTROLS: TYPE HONEYLIELL ELECTRIC CONDITION GOOD TO EXCELLENT
PLANT AUXILIARIES: PUMPS: HW 1) A 5.0 HFCIRC. PUMP.
FANS: 50LAR 1) 208/3/60-2.4 A 1/2 HF 2 CFM ** HEAT 2) 208/3/60-2.4 A 1/2 HF 2 CFM REJECTER 3) 208/3/60-2.4 A 1/2 HF 3 CFM
POOL FILTERHER 1) 708/3/60-29.6A 10 HP ~ 750 GPM ** 2) 208/3/60-16 A _5_HP 104 GPM
AUX OPERATING SCHEDULES: FUMPS: HW 1) ON OFF 2) ON OFF COND 1) ON 2 MIN OFF 40 MIN 2) ON 2 MIN OFF 40 MIN OFF FANS: 1) ON OFF 2) ON OFF 3) ON OFF OTHER: 1) ON ON OFF 2) ON OFF
OTHER: 1)ONCOLTOFF 2)ONOFF

Bldg No.: 1446

Page 7 of 8

MECHANICAL_EQUIPMENT	<u>_DATA</u>		•
OPERATING SCHEDULE:	DATE STARTED CONDATE STOPPED	<u> </u>	
* PRESENT OPERATIO * REQUIRED OPERATI	IN: CONT TO	SAT TO TO	
	ITS: *UNITS MAY B		
	PSI, UNIT 2,4 PSI		NED ON
•	LN.	•	
UNIT Z. BUR	NER: KELLANEE	KEO.33-600	<u> </u>
BLOWE	P: 208/3/60-3	1A 1/2 HP	
	50 110/3/60-10) A	
	EM CIRIC PUMP-		
Solar System co	ntrols OFF - Being he	paired 20 May 92	
FILM #: FRAM	E #:		
SKETCH:			

 \star --> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 1446

Page Sof S



*** FMEA_SURVEY_DESERVATIONS ***
3/26/93
GENERAL BUILDING DATA
#: 1-1526 BLDG NAME: Admin EYED BY: 17/12W DATE: 26 Nov 84 BLDG CONTACT: Candy Christiansen LONTACT TELEPHONE NUMBER: 579-4592 BLDG USAGE: Community Solvice TOT BLDG AREA: 29,850 SF # OF FLOORS: 2 # OF PEOPLE: 75+150
BUILDING OCCUPANCY: MON - FRI: 0730 TO 1615 FIRST SHIFT: SATURDAY: Cloud TO SECND SHIFT: SUNDAY: TO THIRD SHIFT: HOLIDAYS: HOLIDAYS: HOLIDAYS:
ENVIRONMENTAL CONDITIONS:
HEATING SETPOINTS COOLING SETECINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 68 68 68 68 68 68 68 68 68 68 68 68 68
LIGHTING: AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE 1) EN1 14,925 Fluorescent 0.81 ON 0730 OFF 1615 2) EN2 14,925 ON 0730 OFF 1615 ON 0FF 4) ON OFF ATTACHED SCHEDULE? X Y N See page 3 of 11
CEESTITUS ENGLISHED
AREA (SF) TYPE (KW) W/SF ON 0730 OFF ON 0730 OFF ON 0730 OFF ON 0730 OFF ON 0730 OFF ON 0750 OFF ON 0730 ON 0750 ON 0
INTERNAL MASS: MATERIAL: Concrete ESTIMATED MASS: _ (L, 6) H)
INFILTRATION: LOCATION(S): windows door - During Survey 20% windows open for fresh ain - Building is presented. EETIMATED RATE: D M. H) or 15th Flor volume = 119,400 CF AIF: CHANGES or 2nd Flor volume = 119,400 CF CFM/LIN FT CRACK
Assume no infiltration due to pressurization and use of vestibules.
Air handlers bring in 20% fresh air 24 hrs perday.
ZN 1: 2,300 cfm = 1.15 AC/HR ZN 2: 2,860 cfm = 1.44 AC/HR
D 1C2/

Bldg No.: 8-1526

<u>GENERAL BUILDING DATA</u>					
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT NE M: 4" bock (face), 6"CMD, Resid SE S: insulation (1.), gup brd SW E: NW W:	WIDTH 182 82 182 82	HEIGHT - 14 14 14	NET AREA (SF) 4616 2,029 4,420 2,029	U-VALUE 0.1504 0.1504 0.1504	Common of the contract of the
ROOFS: CONSTRUCTION COMPONENT 2N2 & Rigid insulation 21/2" metal cack, ATC space, Accoustic cailing tile. Bu Rooting	width 182	HEIGHT 82	AREA (SF) 14,925	U-VALUE 0.1083	
WINDOWS: AREA(SF) TYPE NE N: 400 * Aluminum fra SE E: 267 ** SW E: 676 *** NW M: 267 ***	SP SP SP SP	X DP	DRAPES DRAPES DRAPES DRAPES	d=1,18	5
FLOOR TYPE: _1 SLAB CRAWL S AREA: _14925 SF PERIMETER: _530 LF INSULATION					-2'-
SPECIAL AREAS:			/		
ADDITIONAL NOTES: Many windows high internal pains (which Are Conditioning is available in the be the supply are registers (except us therefore very little ventilation is anset to 68°F (T-stats located in FILM #: FRAME #: SKETCHES: Note: No	tend wilding. uilding. Len plenu provide. hallways	to overthe Nery li- In fans J. Penon-t J. AHU I	est he builte. He air f operate. a besebood state set	low in Summer) g Testate to 68°F(/a Central hal	xated in lung).
* 48 windows (2'x5') ** 21 windows (2'x5') + 1 door (glass) ** 51 windows (2'x5') + 1 door entrance ** × × × × × × × × × × × × × × × × × ×				9- A .	

* Specify in "Additional Notes"

Bldg No.: P-1526

Page <u>2</u> of <u>10</u>

GENERA	ILDI	NG D	ATA

		ıΗ٦	ΓII	NG SO	CHED	UL	E.								Pa	ageof
	ARE	ΞΑ:	ł	(A) M4 (A)	_NIF		x		SF		(B)	MEZ	zx_		SF	
	DA ⁻	ГА	S	OURCE	E:	[DRAWIN	GS	s	JRY	VEY TO	UR				
	Mar	k	:	#lan	nps	ŀ	W/Fi×	;	#Fix	!	Flr #	1		Comme	ents	
																(12,084 watts)
7	<u> </u>	2_	:	37	<u>36</u>	!	76	: 	168	: 	2.nd	: 	1/2	discon	ected	(12,768 milts)
															,	
			;			1		: 		1		!				
			¦			:		; 		¦ 		!	Note:	. The	lamps	Numbered
			:													only
			1			:		ł		1		ł				s which
			;			ī				:						y activated.
4			!			!				;		1			/	/
			!			;		1		;		!				
			;			;		;		;		!		-		
	•		1			1		!		i		!				
			;			:		:	r <u>ig</u> e	1		ŀ				
			1			l		;		!		1				
			ī			<u> </u>		- - -				:				
	(A)	そ人 TO	ا ر	۲ ۲)	12	<u>۽ د</u>	84		Watt	5/	,1	4,	925	SF=_	0.81	_ W/SF
	(B)	TO	ITA		12	7	<u>68</u>		Watt	5/	′	14,0	125	SF=_	0.86	_ W/SF
	ADI	ΙT	ΊC	DNAL	NOT	ES	:		1 _		2 / 1	_ [1. 1_	_	1. (4	2 6
				i	App	5	xima	tel	ry S	U	/o	igh	क पड	CONNEC	ied t	וט
					7 1	V	nergy		Cons	01	vation	•		CONNEC		

Bldg No.: P-1526

Page 3 of 10

GENERAL BUILDING DATA
MISCELLANEOUS BASE LOADS: DOMESTIC HOT WATER: MANUFACTURER MODEL CONTINENTAL - NOT USAL - FUEL SOURCE NAT GAS ELEC OIL STM GENOTHER* SUPPLY TEMPERATURE F. DISTANCE FROM HEATER FT INPUT RECOVERY RATE OPERATING SCHEDULE
TYPE NO SCHEDULE CONTROL TYPE NO SCHEDULE CONTROL TOTAL KW FUNCTION OF LIGHTS SECURITY PARKING LOT ENTRY OTHER*
ADDITIONAL COMMENTS: Individuel Transformen # 570: 225 KUA, 3 Phone, Manufacturer: Westinghouse
Primary + Socoadary Voltage Connect: 7200/124704 -277/480
The transformer decks out of - No
over voltage or over loading.
FILM #: FRAME #:
ADDITIONAL SKETCHES:

* Specify in "Additional Comments"

Bldg No.: 1-1526

Page <u>4_of[0</u>

MECHANICAL EQUIPMENT DATA
HANDLING UNITS: MANUFACTURER TENTO (2 units) MODEL NO. DHW 21 AHU NUMBER: HV 1 = 2 AHU TYPE: Face & By Pass LOCATION: Pentouse SPACE SERVED: FIRST FLOOR/CECOND FOR
FAN DATA: SUPPLY FAN HP: 7.5 SUPPLY CFM: 14,300 (HV) STATIC PRESS: (COLD) RETURN FAN HP: RETURN CFM: STATIC PRESS: EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS: MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A. X DISCON
COILS: HEATING: HW X STM DIRECT FIRED> NG OIL ELC OTHER NONE COOLING: CW DX FROM CHILLER, FROM DX UNIT REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY, 3 WAY
DAMPERS: O.A. DAMPER: Y (V, N), IF YES, FIXED%, MODULATING% TO% R.A. DAMPER: Y (V, N), IF YES, FIXED%, MODULATING% TO% E.A. DAMPER: N (Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER: Y (V, N), IF YES, OARAENTHALPY OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
TER CONDITION:GOODFAIR X_FOOR Very Dirty
*PRESENT OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR ω 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: χ (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD (G), POOR(P) T'STAT P H'STAT COMPR DAMPERS (T_ LINKAGES (T_ FANS (T_ SHEAVES (T_ VALVES (T_ ACTUATORS (T_ BELTS (T_ MIXING BOX (T_ OTHER
COMMENTS: Notre amperage test: 7.3/7.5/7.1 -> 460 Volts (HUI)

Page 5 of 10

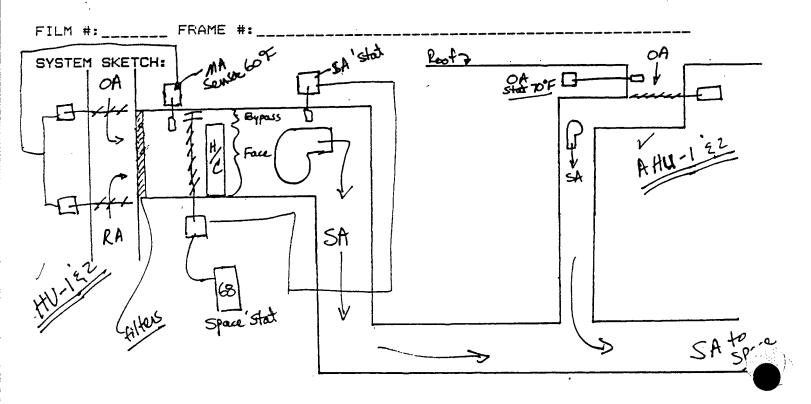
Bldg No.: P-1526

MECHANICAL EQUIPMENT DATA

AIR HANDLING UNITS: The system Face and typens dampers and controlled offer the space Hermorlat, when heat B required, the by peasa damager close and the Face dampers open, that water is continuously supplied to the coil. A temperature drop of 3°F is realized across the two coil will applications and the partial 60°F MA temper are closed.

The DA/RD dampers modulate to maintain 60°F MA temper.

The MA censor is located at top of the MA clumber and measures the cold air for the OA intakes this indicates poor mixing in the MA clumber. Fan runs 24 ha/day with the Clocks. The Attus are energized when the OA stat reached to FE 100% OA is blown into the SA dadwork. During the survey, warm air nigrated up the Attu dactwork and topped the OA stat. The fan was energized for approx 10 seconds and chut off when cold OA reached the OA sensor.



Bldg No.: P-1526

MECHANICA	<u> </u>	<u>ENT_DATA</u>						
TARY H	HEATING E	QUIPMENT: OUTFUT	HEATING			STARTER		
UNIT NO.	TYPE	CAPACITY	SOURCE	CFM	HF'	& CONTROL	SETPOINT	
								,
			هذه خيب مين جين جين مين سب مين					
	Base bo	and hear	ters ru	n_alon	g - 41	stat location on the Control	S, and W	
	facing o	lirections.	. A s.	Mele_f	lerme	stat locati	ed in each	
ciry di cedir	A	Colvey	controls	<u>a</u> u	alre	on the C	espective_	,
0	Loops	Your on on	Loop Honey	well Mod	utrol ac	to on Control	VLVs. (1") (2	41/11/1)
6 20	nes for bo	iseboard her	lons with	a Cont	rol Valu	e. Z. Zones C	one off the	
MAHW	lines that	go to the M	/m/42.					
		•	, eu eu eu eu eu eu eu eu					
							منٹ کے سے متب میں ہے ہیں ہے ہیں۔	
					_ _			
FILM #:		FRAME #: _						
NOTES:	TYPE>	unit heat	er, unit v nace, etc.	ventilat	or, d	uct furnace	•	
yersen,		SOURCE:	electric, hot water	r, etc.		oil, steam,		
	STARTER	& CONTROL	> moment	tary, ma	aintai	ned, line v ntained, et	stat, c.	

Bldg No.: P-1526

Page 7_of 10

EXHAUST FANS: UNIT NO. TYPE CFM HP * CONTROL SETPOINT 7.5 55°F O. Acutant Atta-2 contribugal solves 2 of floor 7.5 Coff O. A. which FILM #: FRAME #:	MECHANICA	L_EQUIPM	ENT_DATA						SE:
UNIT NO. TYPE CFM HP & CONTROL SETPOINT SS'F O. A cotact Active-2 Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Co'F O. A cotact Contrologic Sources 2 - floor 7.5 Contrologic Sources 2 - floo	EXHAUST F	ANS:					GTARTER.	ş; (
	UNIT NO.						& CONTROL		
	- <u>Alta-</u> L	centation	l sorver	1st floor		<u>7.5</u>		55°F O. Acutous	-
	AHH - Z	centrifu	gal serves	2-floo	C	<u>7.5</u>		60°F O. A. cutor	1_
									4
									•
								·	
				·					
ETIM H. CEIOME H.									

NOTES: TYPE --> propeller, centrifugal, etc.

STARTER & CONTROL --> momentary, maintained, line v stat,

24 v stat, self contained, etc.

Bldg No.: P 1526

Page 8_of 10

MECHAN	ICAL	EQUIPMENT	DATA

Bldg No.: P-1526

PLANT DESCRIPTION:	HEATING PLANT		
NUMBER OF UNITS: 1 MAKE & MODEL: 1) 2)			
EQUIFMENT: DOILER TYPE: STEAM DHW FUEL: NAT GAS L	DIRECT FIRED CAST IRONWAT ECTRICOIL	STEAM CONV ER TUBE, FIRE TUB OTHER	E
MULTIPLE UNIT OPERATION SERIES	SEQUENCE: PARALLEL		
BURNER STAGES:			
FIRING RATE/FUEL:#1:_		#2:	
BURNER TYPE: POWER:		Piett MOD No. R&	-G- 05 CFM
HOT WATER: SUPPLY : RETURN : HEADER :	GIZE TEMPER	RATURE 158 PPRESS RATURE 140 PRESS RATURE PRESS	URE <u>20</u> psi UREpsi UREpsi
	BTUH OUT		
CONTROLS: TYPE CONDITION _			
PLANT AUXILIARIES: FUMFS: HW 1)/ 2)/ -3)/	-/A	75 HF HVU-1 SOISHF HVU-2 HF NW 1ST FL HF NE 1ST FL	R REBD L R BSBD L
5 /	-/A - <u>Y</u>	12 HF 13	CFMCW IST FLR BIBD GFM'SE ZMO FLR BIBI CFM
OTHER 1)/ 2)/	/A	HP HP	
COND 1) ON FANS: 1) ON	OFF2)ON	OFF OFF 3)ON	OFF
XILIARY FUEL USED:	#2 DIL NA	T GAS OTHER	

Page 9 of 10 TURM!

<u>1ECHANICAL_EQUIEMENT</u>	DATA		
OPERATING SCHEDULE:	DATE STARTED _ DATE STOPPED _		
* PRESENT OPERATION * REQUIRED OPERATION			SUN - TO TO TO TO
OTHER PLANT COMMENT	& Surface		
Honguell Hot l			
SW & NW ZMI	FLIR Rasel	ond pre fed by	HUU-1 and
FILM #: FRAME	#:		
SKETCH: • 4-3way BB 3@14 1@24 1@14	ZONE VAL	UES (PEPL), OP	ERAFORS (?)

 \star --> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 9-1526

I PUMP PLANGE LIEAKING

Page 10 of 10



	mear sure	THE DA	T 4		,	9/92	5		•
	ERAL_BUILD					AJN/JOE	/ .		. 4
CON	5 #:1528 VEYED BY: TACT TELEF BLDS AREA	TEATAL HONE N : 27,3	G NAME: DATE: UMBER: Z Z SF	MAIN /C 11/2/2/2 250/22/ # OF F	ETALE BLD ELOORS:	SRAKY DG CONT G USAGE	JOI ACT: MR : ORFICE: # OF PEOR	TLE: SE	C4 R ARY E ATTACHE CHEDULE
⊬BUI	LDING OCCU F SATI SU	FANCY: RIDAY IRDAY INDAYS	MON - T SATURDA SUNDAY: HOLIDAY	`Hod: 01100	7 TO 210 7 TO 18 7 TO 170 7 TO 170	202 FI 2020 SE 2020 TH HO	RST SHIF CND SHIF IRD SHIF LIDAYS:	т.	
ENV	IRONMENTAL	CONDI	TIONS:						
PRE REQ T	SENT TEIY A UIRED T'ST HERMOSTAT UMIDIFICAT	DA P: _2 AT: 66 LOCATI ION RE	HEATI WEEKDAYS Y NIGHT L 29 ON(S): 4 OULDEMENT	ING SEIFS WEE DAY	DINTS EKENDS NIGHT - 74 - 25 OLUMN	WE DAY _ 78 _ _ 78 _6 _ 2 _ E MAL H'STAT	COOLINGER NIGHT 18 CEE LS (4 EA	VE SETES WEEK DAY -78 -78): CORRII	ENDS NISHT -78 OFF XXECONF
		1017 110		•	400 die 600 cm	··· - ;····			
	HTING: AREA(EF) 21300 	LAMP FL/	TYFE ING	·	#LMFS	₩/SF _102_ 	SCHE ON <u>OCC</u> L ON ON	OFF	
	A SOURCE: A	OBSE SCHEDU	RVATION _ LE? _ <u>/</u> Y	ASHRAE	от	HER	חאם	_ UFF	
1) 2) 3)	CTRIC EQUI AREA(SF) 21,300 _ 				(KW)	w/sf 1Z5	0N_QCC1 0N_ 0N_	OFF	
4) DAT SEE	A SOURCE: ATTACHED	ZOBSE SCHEDU	RVATION LE?Y	ASHRAE	:от	HER	ON	OFF	
INT	ERNAL MASS	: MATE	RIAL: 📙	00K5	E	STIMATE:	D MASS: M	1 (L. M.	H)
INF	ILTRATION: ///RG,EM	LOCAT PLOYE	ION(S): J	FIXED WU	MOOMS,	VESTIB	ULE ENT	RIEG, FI	RE
pion Seri Line	STIMATED R	ATE:	(L, M, AIR CH CFM/LI	H) or HANGES or IN FT CRA	- 39 NOK	950 C	FM		
	DA TEMP								
!									

Bldg No.: 1528

Page 1 of 13

GENERAL BUILDING DATA	· ()			
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT N: EXTMALL 101 *** S: "" E: "" W: "	WIDTH 153-6" 153-6" 729-4" 729-4"	HEIGHT 16-4" 16-4" 16-4" 16-4"	AREA (SF) 2358.5 2210.9 3458.3 3332.5	U-VALUE Ø.103 Ø.103 Ø.103
ROOFS: CONSTRUCTION COMPONENT ROOF 42 ***	WIDTH 230'-0"	HEIGHT	AREA (SF) 21, 300	
WINDOWS: AREA(SF) TYFE N: 144.0 FIXED S: 291.6 " E: 277.2 " W: 402.0 "	SP	DF	DRAPES	
FLOOR TYPE: SLAB CRAWL AREA: 27,300 SF PERIMETER: LF INSULATION				
SPECIAL AREAS:				
ADDITIONAL NOTES: * BUILDING OCC	JPLED_ER	OM 0700	TO LODO F	34
STAFF OLLY (~6 PEOPLE).				
** COOLING IN CONFERENCE ROOM	DULY-J	X TON DX	<u></u>	
*** SEE ATTACHED BLAST SIMULA	tion Lie	Brary W	DN-SID DE	EINITIONS'
ALLT-STATE SEI 5-6 BELOW	MEAGUS	RED TEMP	, INDICATI	= Z-3°
ALOVE GET TEMP, EXCEPT CON	FERENCE	ERM.		
FILM #:FRAME #:				
SKETCHES:				

^{*} Specify in "Additional Notes"

*** FMEA_SURVEY_DBSERVATIONS__***

3	E	N	Ε	Ŕ	Α	L	В	U	Ι	L	D	Ι	N	6	D	Α	Т	Α	١

IT!	ING SCHEI	ULE			Fageof
					EZZXSF
DATA S	BOURCE: _	DRAWING	ss <u>/</u> su	RVEY TOU	r.
Mark	#lamps	W/Fix	¦ #Fix	SCHED	: Comments
					STACK AREA
_ <u>F</u>	4	142	61	! !!	STACK AREA
F	3_	105	1 24	; <u>(</u>	STACK AREA /STUDY RMS
		•			CHILDRENS ROOM
F	4	142	18	! H	MILITARY RDG
F					OFFICES
=====					CONFERENCE
	1 2	171	1.1	100%	READING ROOMS
	1 3			· ·	REFERENCE STACKS
					VESTIBULE/EXT, LIGHTING
	!	!	!	!	
	1	:	1		
	!	1	1	1	
	!	!	!		
(A) TC	TAL: <u>5</u> 1	,857	Watt	==/_21,3	00 SF= <u>1.900</u> W/SF
					SF= W/SF
	IONAL NO				



Page 3 of 13

GENERAL BUILDING DATA	,
MISCELLANEOUS BASE LOADS: DOMESTIC HOT WATER: MANUFACTURER & MODEL FUEL SOURCE NAT GAS ELEC OIL STM SUPPLY TEMPERATURE OFF 'F, DISTANCE FROM HEATER INPUT 42,000 RECOVERY RATE 35340 OPERATING SCH	50 GAL GENOTHER* FT EDULE SHUTOFF
TYPE NO SCHEDULE TYPE NO SCHEDULE TOTAL KW FUNCTION OF LIGHTS SECURITY PARKING LOT OTHER* ADDITIONAL COMMENTS: FACILITY TOWNS FRAME.	ENTRY
ADDITIONAL COMMENTS:	111, 1300 KV/1,
3 phase, Manufacturer: G.E. Poman	+ Secondary
3 phase, Manufacturer: G.E., Pomany Voltage	:7700/12470 Y
	- 611/700
The transformer checks out ok-	No onervoltage
a over	looding.
FILM #: FRAME #:	
ADDITIONAL SKETCHES:	

* Specify in "Additional Comments"

Bldg No.: 1528

MECHANICAL_EQUIPMENT_DATA

Bldg No.: 1528

	HEATING PLANT
NT DESCRIPTION NUMBER OF UNIT MAKE & MODEL:	
TYPE: STEA	BOILER DIRECT FIRED STEAM CONV M HW CAST IRON WATER TUBE, FIRE TUBE ELECTRIC OIL OTHER
	PERATION SEQUENCE:
BURNER STAGES	• ————————————————————————————————————
FIRING RATE/F	UEL:#1: 1,005 MBH / NAG #2: NONE
	FOWER: MFR GORDON-PIATT MOD NO. R8-G-05 BLOWER 480/3/40-0.7 A HP @ CFM CONTRL 120/1/40-5 A ATMOS: MFR MOD No.
HOT WATER: STEAM:	SUPPLY SIZE 3" TEMPERATURE 140 PRESSURE 15PSI RETURN SIZE 3" TEMPERATURE PRESSURE PSI HEADER SIZE PSI
ATED CAPACIT	Y: MAX BTUH IN 1,005,000 BTUH MAX BTUH OUT 804,000 BTUH
CONTROLS: TYP	E HONEYWELL ELECTRIC DITION GOOD
PLANT AUXILIARI PUMPS: MT HW COND	ES: 1) 480/3/60 ~ 2.15A — HP (WINTER ONLY) 2) 480/3/60 - A 412 U HP (SUMMERONLY) 1) — — — A — — HP 2) — — — HP
FANS:	1)/_/AHP @CFM 2)/_/AHP @CFM 3)/_/AHP @CFM
OTHER	1)/AHP 2)//AHP
AUX OPERATING S FUMPS: HW COND FANS: OTHER:	CHEDULES: 1) ONOFF 2) ONOFF 1) ONOFF 2) ONOFF 1) ONOFF 2) ONOFF 3) ONOFF 1) ONOFF 2) ONOFF
XILIARY FUE	L USED: #2 OIL NAT GAS OTHER

Page 5 of 13

MECHANICAL_EQUIPMEN	<u>L_DATA</u>			•	
OPERATING SCHEDULE:	DATE ST DATE ST	ARTED			
* PRESENT OPERATION * REQUIRED OPERATION	MO JN:	N - FRI TO	SA T(T(r D	SUN TO TO
OTHER PLANT COMMEN		·	_		
\$100 Miles (100 Mars along alles along Alles and along any along any along any along any				· · · · · · · · · · · · · · · · · · ·	
					,
			•		
FILM #: FRAM SKETCH:	1E #:				
		1.1-	. *		ar en en en en en en en en en en en en en

* --> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 1528

Page 6 of 13

MECHANICAL EQUIPMENT DATA

ARIPTION: MANUFACTURER: TRAVE NUMBER: ENERGY SOURCE: ELEC STM HW OTHER (Specify) COMPRESSOR KW CAPACITY: TONS TYZ AGE CONDENSER: AIR COOLED WATER COOLED UNIT OFERATION: PARALLEL SERIES SYSTEM SERVES AHU NO(8): COOLING TOWER DATA: MANUFACTURER: LOUIS NO. of CELLS: BLOWERS: 1) // A @ CFM 2) // A @ CFM DISTANCE TO COOLING TOWER FROM CHILLER CONTROLS & OPSEG: TW3 UNIT B USED ONLY TO COMPANY FOR THE STATE ON T	•	CO	OLING PLANT	r data:		
SYSTEM SERVES AHU NO(s): COOLING TOWER DATA: MANUFACTURER: LOUE TYPE: BLOWERS: 1)	MANUFACTURER: NUMBER: ENERGY SOURCE:	TRANE TELEC	YPE: OX -GE STM AGE	MODEL: NTRIFOGAL HWOTHER	RAS-831 ABSORFTIO (specify)_	N RECIF
MANUFACTURER: LOLE NO. of CELLS: TYPE: BLOWERS: 1)	UNIT OPERATION	V: PAR	ALLEL S	BERIES		
CAN A STRAINER CYCLE OR FLAT PLATE HEAT EXCHANGER BE INSTALLED IN THIS CASE? JW TEMPERATURE: SUPPLY	MANUFACTURER: TYPE: BLOWERS: 1) 2) 3) DISTANCE TO CO	LIQUE	A @ A @ A @ ER FROM CHI	NO. O+ CEL CFM CFM LLER	.LS:	
PLANT AUXILIARIES: PUMPS: CHW 1)	CAN A STRAINER	: CYCLE OR	M USRA	HEAT EXCHANG	ER BE INST	ALLED IN
PUMFS: CHW 1)	ONW TEMPERATU	RE: SUPPL'	Y'F, RE Y'F, RE	TURN 'F, F	·IPE SIZE	IN
FANS: COOLING TOWER 1)	PUMPS: CHW	(1) (2), (1),	//Hz _ //Hz _	AHF	GPM ON GPM ON	OFF
OPERATING SCHEDULE: DATE STARTED DATE STOPPED MON - FRI SAT SUN * FRESENT OPERATION: TO TO TO	FANS: COOLING TOWER CONDENSER OTHER	1)	//_Hz _ //_Hz _ /3/60Hz _ /3/60Hz _ /3/60Hz _	AHP @ AHP @ AA HP @ A HP @	GPM ON GPM ON GPM ON GPM ON	GFF OFF OFF OFF
* FRESENT OFERATION: TO TO TO TO	OPERATING SCHEDU	LE: DATE	STARTED			
	* FRESENT OPER * REQUIRED OPE	ATION: FATION:	TO	TO		

-> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 1528

__FMEA_SURVEY_DESERVATIONS__

MECHANICAL_EQUIPMENT_DATA
AIR HANDLING UNITS: MANUFACTURER TRANE AHU NUMBER: HV-1 AHU TYPE: HORIZONTAL DRAW-THRU LOCATION: PENTHOUSE SPACE SERVED:
FAN DATA: SUPPLY FAN HP: Z.Z/5 SUPPLY CFM: 12.730 STATIC PRESS: 1/8' RETURN FAN HP: RETURN CFM: STATIC PRESS: EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS: MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A DISCON
COILS: HEATING: HW Y STM _ DIRECT FIRED> NG _ DIL _ ELC_ OTHER, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, FROM DX UNIT, TYPE, FROM DX UNIT, TYPE, FROM DX UNIT, FROM DX UNIT, TYPE, FROM DX UNIT
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING O % TO 100% R.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING O % TO 100% E.A. DAMPER: U (Y, N), IF YES, FIXED -%, MODULATING % TO _% ECONOMIZER: U (Y, N), IF YES, OA - RA - ENTHALPY - OA LEAKAGE: 15 % IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRPOOR
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: CONTINUOUS TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETEOINTS COOLING SETEOINTS WEEKDAYS WEEKENDS WEEKENDS
#PRESENT TEMP: 76
SYSTEM SETPOINTS: MIXED AIR F., HOT DECK 'F, COLD DECK 'F. TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) TISTAT GANISTA
COMMENTS: REHEAT COILS ARE 7.5 KW (25,500 BTUH) AND 15 KW
(51,2000 BTUH). THEY SERVE ROOM 132 EAST & LIEST, BOTH ON
T-STATS, Mived Air set at 60°F; two position control either all RA. or all O.A.
* SUNDAYS & HOLIDAYS
Bldg No.: 1528 Fage 8 of 13

HANDLING UNITS: MANUFACTURER AHU NUMBER: HV-2 AHU TYPE: HORIZONTAL DRAW THRU LOCATION: PENTHOUSE SPACE SERVED:
SUPPLY FAN HP: 22/5 SUPPLY CFM: 10455 STATIC PRESS: 1/8" RETURN FAN HP: RETURN CFM: STATIC PRESS: STATIC PRESS: STATIC PRESS: DISCON DISCON
COILS: HEATING: HW V STM DIRECT FIRED> NG OIL ELC OTHER O COOLING: CW DX FROM CHILLER FROM DX UNIT TYPE RECOOL: # OF COILS TYPE HO HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY, 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED _%, MODULATING 0% TO 00% R.A. DAMPER: Y (Y, N), IF YES, FIXED _%, MODULATING 0% TO 00% E.A. DAMPER: N (Y, N), IF YES, FIXED _%, MODULATING _% TO _% ECONOMIZER: N (Y, N), IF YES, OA _ RA _ ENTHALPY _ OA LEAKAGE: _ % IF NO, CAN ECONOMIZER BE ADDED
TER CONDITION:FAIRFOOR
*PRESENT OPERATION: 5EE HV-L MON - FRI SAT SUN *PRESENT OPERATION: TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP:
*REQUIRED TMP:
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: _U_ (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N) CONTROLS: PNEUMATIC, ELECTRIC HOLEVUELL, PNEUMATIC/ELEC EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT G H'STAT COMPR DAMPERS G LINKAGES G FANS G SHEAVES G VALVES G ACTUATORS G BELTS G MIXING BOX G OTHER
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N) CONTROLS: FNEUMATIC, ELECTRIC HOLENDELL, FNEUMATIC/ELEC EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) T'STAT G H'STAT COMPR DAMPERS G LINKAGES G FANS G SHEAVES G VALVES G ACTUATORS G BELTS G MIXING BOX G

*** FMEA_SURVEY_DBSERVATIONS__***

WETHUNICHE ERDIEDITERIT
AIR HANDLING UNITS: MANUFACTURER AHU NUMBER: LEZ AHU TYFE: HORLZONTAL DRAW-THRU LOCATION: PENTHOUSE SPACE SERVED:
FAN DATA: SUPPLY FAN HP: 5 SUPPLY CFM: 12,950 STATIC PRESS: 1 RETURN FAN HP: - RETURN CFM: - STATIC PRESS: - EXHAUST FAN HP: - EXHAUST CFM: - STATIC PRESS: - MOTOR STARTER: MNT _ MOM SWITCH: P.B H.O.A. PDISCON _
COILS: HEATING: HW _ STM _ DIRECT FIRED> NG _ OIL _ ELC_ OTHER _ COOLING: CW _ DX FROM CHILLER FROM DX UNIT REHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE HUMIDITY: STM _ SPRAY _ ELC HW/CW CCIL VALVES: 2 WAY _ , 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING _0% TO _00%. R.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING _0% TO _00%. E.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING _0% TO _00%. ECONOMIZER: Y (Y, N), IF YES, OA RA ENTHALPY OA LEAKAGE: % IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRFOOR NONE
SYSTEM OPERATION: * MON - FRI SAT SUN *PRESENT OPERATION: COMMUNICATION: BLOG SCHEDULE TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 53 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC ELECTRICHONEYWELL PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) T'STAT H'STAT COMPR DAMPERS _P LINKAGES G_ FANS G_ SHEAVES G_ VALVES ACTUATORS BELTS G_ MIXING BOX G_ OTHER
COMMENTS * LIVIT OPERATES SUMMER ONLY at below 75°F @A. Texp.

Bldg No.: 1528

Fage 10 of 13

MECHAN	ICAL	EQUIPMENT	DATA

HANDLING UNITS: 75° INTROL STRATEGY: SUMMER - AHU L'22 ON @ OA 770° F
WINTER-AHU LEZ OFF, 3E4 ON, BOILER ON @ OA 65°
NIGHT-AHULEZ OFF
ADDITIONAL AHU/SYSTEM COMMENTS:
MIHU RESET SCHED-
OA SUPPLY WATER TEMP OF
5° 195°
65° 120°
7-0 SPACE ABOVE CEILING IS RAPLENUM. LIGHT FIXTURES ARE
CA DIFFLIGERS, RA GRILLES ARE LAY-IN EGG-CRATE TYPE.
FILM #: FRAME #:
SYSTEM SKETCH:



*** FMEA_SURVEY_OBSERVATIONS__***

MECHANI	CAL EQUIPN	MENT_DATA					
UNITARY	HEATING E	EQUIPMENT:	HEATING			STARTER	•
UNIT NO	. TYPE	CAPACITY	SOURCE	CFM	HP	& CONTROL	SETPOINT
CHH-L	LINIT	14,000	MIHW			24 V STAT	_70°
CHH-L		40,000					
							vago, quare passe desse modé viens féliles facul
				·			
	_ ·	·					
				·			
UNITE	LOCATES	ONE C	L) JN EACH	L VESTI	BULE	:	
FILM #:	F	FRAME #: _			. _		
		·				ct furrace,	
		wall furn	ace. etc. electric.	gas fi		oil, steam,	
	STARTER 8	CONTROL :		ary, ma		ed, line v	
			∠4 V S	itat, se	TH COL	itained, etc	•

Bldg No.: 1856

Page 12 of 13

MECHANICAL EQUIPMENT DATA

AUST F	FANS:						
UNIT NO.	TYPE			CFM	HF'	STARTER & CONTROL	SETPGINT
EF-L	CENT	TOLLET	.375 ¹ 5P	600	1/12	WLIGHTS	
			·			L.V. STAT	
						11	

			<u> </u>				
					~~		
						~~~~~~~	*****
<b>———</b>							
		· · · · · · · · · · · · · · · · · · ·					
			·				
	····	·					
							***************************************

TYPE --> propeller, centrifugal, etc.

STARTER & CONTROL --> momentary, maintained, line v stat,

24 v stat. self contained, etc.

## GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

ECO TITLE	ANNEX A	DATE	AN	NEX B	DATE	COMMENTS
VSULATION	- A1		#	B01	NO	NA
TORM WINDOWS OF DOUBLE GLAZING	-A2		#	B02	YES	SP 14" H
EATHER STRIPPING and CAULKING	A3		#	B03	NO	Building 13 Pressurited.
VISULATED PANELS	- A			B04	7E5	ON ALL WINDOWS
ESTIBLES OF REVOLVING DOORS	A5			B05	NO	N/A- IN PLACE
ESTIBULES OF REVOLVING DOOR On Air Cult				B06	NO	N/A- LD ENCLOSED
DAD DOCK SEALS (Strip Door or Air Cu)	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~			B07		SEE 204
EDUCTION OF GLASS AREA				B08		SEE BLO
EPLACE KITCHEN LIGHT FIXTURES				B09	NQ	DHW OFF
HUTDOWN DHW or MOD CTRLS (Non FH)	AlO			B11	NO	DAW DEF
EDUCE LIGHTING LEVELS				B12		SEE B10
EPLACE INCANDESCENT LIGHTING	A11	ļ			-110	
SE MORE EFFICIENT LIGHTING SOURCE	A12			B10	NO	NA - IN PLACE
IGH EFFICIENCY MOTOR REPLACEMENT	A13	<u> </u>		B13	YES	ON AHU'S & PUMPS
IGHT SETBACK/SETUP THERMOSTATS *	A14			B14	YES	
NFRARED HTRS (Motor Rep Shops & Whise)	A15			B15	NO	N/A
CONOMIZER CYCLES (Dry Build Type)	A16			B16		N/A
ONTROL HOT WATER CIRC PUMP *	A17		<b>T#</b>	B17	NO	I N/A
M RADIO CONTROLS	A18		<del>Ι</del> Ξ	B18		
ADIATOR CONTROLS	A19		1	B19	NO	IN PLACE
ECENTRALIZE DHW HIRS (POU Htrs) *	A20	<del> </del>	1	В	NO	DHW DEF
EAT RECLAIM from HOT REFRIG GAS	A21		#	<b>B2</b> 0	NO	NONE AVAIL IN HTG SEASON
EDUCE AIR FLOW *	A22	<del> </del>		B21	NO	N/A
PROUE AIR FLOW	A23	<del> </del>		B22	NO	NO STRAT
REVENT AIR STRATIFICATION *	A24	<del> </del>	+"-	B23	70	N/A
NSTALL TIME CLOCKS	A25	<del> </del>	+-	B	NU	NO COOLING
HILLER REPLACEMENT	A26	. <del> </del>	╂	1338	70	NO CIVETAGE
EPLACE ABSORPTION CHILLER			╂	B26		MTHW BOILER
NSULATE STEAM LINES	A27	<del> </del>	<del>-</del>	B27	NO	MITTALES
RETURN CONDENSATE	A28	<b>-</b>	┦		ЙÒ	
TRANSFORMER OVERVOLTAGE	A29_	<u> </u>	4	B31	YES	
TRANSFORMER LOADING .	A30			B30	YES	
REVISE OR REPAIR HVAC CONTROLS	A31	1		B32	YES	
VASTE HEAT RECOVERY *	A32_			B33	NO	NONE AVAILABLE
ADD ADDITIONAL LIGHT SWITCHES	A33			B35	NO	ADEQUATE
WAC INIT/BLDGS WITH SEPARATE BOILERS	A34			B37	NO	
STANDARD SOLUTIONS for EXT LIGHTS	A35		#	B36	NO	ON P/C CONTROL
BOILER OXYGEN TRIM CONTROLS	T_A _		T	B24	YES	ADAPTIVE TYPE
REVISE BOILER CONTROLS	A	1	1	B25	NO	I BOILER
PRE-HEAT DHW	<del>  A</del>	1	1	B28	NO	
	TA A	+	#	B29	NO	
EAT PUMPS	T A	+	+"-	 	VES	
BCS	<del>  ^</del>	╂	+-	M40,17	1-35-	
HOT WATER RECIRC PUMPS			+-		<del> </del>	
HPS STREET LIGHTS ELECTRIC OUTLET INSULATION	A		4-	 M42	<del> </del>	

<*> Denotes ECO's studied by Burns & McDonnel
<#> Denotes ECO's common to Military Family Housing



*** FMEA_SURVEY_OBSERVATIONS***
GENERAL BUILDING DATA  GENERAL BUILDING DATA  GENERAL BUILDING DATA  GENERAL BUILDING DATA  GENERAL BUILDING DATA  GENERAL BUILDING DATA  JOB #: 124  JOB #: 124  JOB #: 124  SORVEYED BY: PT/RYAN DATE: 20 NOV 85 BLDG CONTACT: 55G ROGEVS  CONTACT TELEPHONE NUMBER: X 4449 BLDG USAGE: dental Care  TOT BLDG AREA: 14615 SF # OF FLOORS:   # OF PEOPLE: 50+ 150 patrioch
BUILDING OCCUPANCY: MON - FRI: 07/5 TO 1600 FIRST SHIFT: SATURDAY: TO TO SECND SHIFT: SUNDAY: TO TO THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
ENVIRONMENTAL CONDITIONS:  HEATING SETPOINTS  WEEKDAYS  WEEKDAYS  DAY  NIGHT  PRESENT T'STAT:  72  72  72  72  72  72  72  72  72  7
LIGHTING:  AREA (SF) LAMP TYFE #LMPS W/SF SCHEDULE  1) 2N1: 6365 Flue and irond—See 1.56 ON 2715 OFF 1600  2) 2N2: B258 ON 0715 OFF 1600  ON OFF  ON OFF  A SOURCE: X OBSERVATION ASHRAE OTHER  ATTACHED SCHEDULE? X YN see page 3 of 1
ELECTRIC EQUIPMENT:  AREA (SF) TYPE  1) 2N1: 6365 Mixelmons land Fami est: 1.0 W/F ON 0715 OFF 1600  2) 2N2: 328 and type water 1, etc75 W/SF ON 0715 OFF 1600  3)  ON OFF  DATA SOURCE: X OBSERVATION ASHRAE OTHER  SEE ATTACHED SCHEDULE? Y X N  (est 5% on et sight)
INTERNAL MASS: MATERIAL: Grip putition, concide ESTIMATED MASS: (L. M) H)  INFILTRATION: LOCATION(S): Verticula (Main entrunce) Saves much energy by  Keeping out Militration. Ruilding is slightly pressurized.  ESTIMATED RATE: L. M. H) or  AIR CHANGES or HEATED BLOG VOLUME = 50,920cf 66,064cf  CFM/LIN FT CRACK  Assume no infiltration due to pressurization and
use of vestibulee.

Bldg No.: P-1855

Page of

SENERAL BUILDING DATA COMPANY '
NET
WALLS: CUNSTRUCTION CONTROLLER WILD IN THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTROLLER OF THE TOTAL CONTR
1-020 00 100 000 000 000 000 000 000 000 0
SWE: 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
MM: _ The
ROOFS: CONSTRUCTION COMPONENT WIDTH HEIGHT AREA(SF) U-VALUE
ZN1: Builtup Roof 5" Rigid 95 67 6865 0,05
a = 13, $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a = 13$ , $a =$
SE ZNC. Anspare Copped Ceiling.
TVEF
WINDOWS: AREA(SF) TYPE  NE M: 192   Aluminum frame SP DP DRAPES  SW E: 158   WHY  SP DP DRAPES  DP DRAPES  DP DRAPES
NE N: 192 Aluminum trane SP DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES DP DRAPES
SW E: 158 CFF DP DRAPES ()
NW 4: 157 FRED DP DRAPES
ACRIZONTAL: 192
FLOOR TYPE: SLAB _X CRAWL SPACE BASEMENT OTHER*
AREA: 6365 SF (Located under interior zone)
PERIMETER: 492 LF INSULATION? X Y N IN 1 1/2 MIN
PERINETERS INSULATION. ZS
SPECIAL AREAS: U = .2
- 1) Lhist (Dlate) of t
ADDITIONAL NOTES: T-stats are single set point (Rabert Show). Most
state set for 70 to 73°F. The crowl space is hested by the
SIAUS SUI TIV 10 TO 15 P, TIME CLOWI SPACE IS THE
mechanical Room, therefor assume no floor heat loss.
NOTE: The building is Apressurited, therton infiltration is low.
NOTE: The buttory is A present tee, Thator MITCHION IS TOWN
· · · · · · · · · · · · · · · · · · ·
FILM #:FRAME #:
SKETCHES: (3)(11.3 sF) + (4)(22.6 sF) + (2)(33.9 JF) = 192 SF
(3)(11.3 sF)+(4)(22.6 cF)+ (4)(32.5 cF)
(3)(11.35F) + (2)(22.65F) + (1)(33.95F) + (1)(45.25F) = 1585F (3)(11.35F) + (2)(22.65F) + (1)(33.95F) + (1)(45.25F) = 1585F
(**) (3)(11.55F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F) + (2)(22165F)
(1) (11.3 SF)+(2) (73 SF) = 157 SF
(doors)

Bldg No.: <u>P-1855</u>

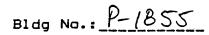
Page 2 of 14

^{*} Specify in "Additional Notes"

### GENERAL BUILDING DATA

HTI	NG SCHEDUL	_E						Pag	geof
AREA:	(A)MAIN	x	SF		(B) MEZ	zx		3F -	
DATA S	SOURCE: XI	DRAWINGS	ss	URVEY	TOUR				
Mark :	#lamps :	W/Fix !	#Fix	; Fl	r # !		Commer	nts	
Center	fluorescut	76	137			9,956			(ENI int)
SW !	Anoresati	76	7	·	 	532			(ZNZ)
SW !	incondexent	150	17	:		2,550			
MM:	Auor:	76:	10.	1		760			
NW!	Mand.	200 1	3	, <b>!</b>		600			
NE '	Auor 1	76 1	62			4,712			
	fluor '					2,052			·
CE	fluor !	76 1	.49	<u> </u>		3,724			
	incard.					•			ZNZ)
	1								
1	!	! !	<del></del>	!					
	!			:					
1	[ ]	!		:	:		<del>.</del>		an 400 ann 400 400 an an an an an
1	!	!		:	. (				
				:	<u>;</u>				
ی ۸ج TOT (A)	L AL: 9,	956	Wat	<b>-</b>	6,36	S	SF=	1.56	_ W/SF
	ONAL NOTES				•				

ADDITIONAL NOTES:



## *** FMEA_SURVEY_DESERVATIONS_ ***

PENEKUT BOILDING DATA
MISCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER & MODEL DOMESTIC HOT WATER CONVENTOR HEZ  FUEL SOURCE NAT GAS ELEC OIL STM GEN LOTHER*  SUPPLY TEMPERATURE 140 F. DISTANCE FROM HEATER FT  INPUT RECOVERY RATE OPERATING SCHEDULE
EXTERIOR LIGHTING:  TYPENO SCHEDULE CONTROL  TYPENO SCHEDULE CONTROL  TOTAL KW FUNCTION OF LIGHTS SECURITY FARKING LOT ENTRY  OTHER*  ADDITIONAL COMMENTS: Valve modulates to maintain 140° F
Supply temperature from HTHW.  DHW circulating pump - 1/12 to ; Storage tank temperature
I myintained at 178%.  11/2" 2-WAY DeZurik Gastral Value (Prew.) on HTHW. Z'E"3-WAY Condul Value HW Coil AHU Prev. Robort Show.  Individual Transformer # 656: 150 KVA, 3 Phase,
Manufactures: G.E., Primary + Lecondary Voltage: 7200/124704
ADDITIONAL SKETCHES:  The Transformer Checks out Ok-  No overvoltage or over  loading.

Bldg No.: P-1855

Page 4 of 14

^{*} Specify in "Additional Comments"

MECHANICAL_EQUIPMENT_DATA	
COOLING PLANT DATA:	
MANUFACTURER: TYRUE (HWCOMMENT) MODEL: RAVA 4004 - RB NUMBER: 1 TYPE: CENTRIFUGAL ABSORPTION RECIP ENERGY SOURCE: VELEC STM HW OTHER (Specify)	
COMPRESSOR KW AGE 1976	
CONDENSER: X AIR COOLED WATER COOLED  UNIT OPERATION: PARALLEL SERIES  SYSTEM SERVES AHU No(s):1	
COOLING TOWER DATA:  MANUFACTURER: MODEL:	
TYPE: No. of CELLS: BLOWERS: 1)/_/A @CFM	
BLOWERS: 1)/A @CFM 2)/_/A @CFM	
3)/A @CFM DISTANCE TO COOLING TOWER FROM CHILLER	
· · · · · · · · · · · · · · · · · · ·	
CONTROLS & OPSEQ:	
CAN A STRAINER CYCLE OR FLAT PLATE HEAT EXCHANGER BE INSTALLED IN	
THIS CASE?	
CW TEMPERATURE: SUPPLY 'F, RETURN 'F, PIPE SIZE IN CNW TEMPERATURE: SUPPLY 'F, RETURN 'F, PIPE SIZE IN	
PLANT AUXILIARIES: 1.5 GE 263-230/460V; 5.8-5.6/2.8V	
FUMPS: CHW () / _ Hz A Z_ HF @ GFM ON OFF HW 2) 230 / 3 / 60 Hz 5.0 A 1.5 HP @ GPM ON OFF	
CANN 1) / / Hz A HP @ GPM ON OFF	
CHW 2) / Hz A 2 HF @ GFM ON V - OFF> For chilled was	ibs. Vevi
EANS:  COOLING TOWER 1)/_ HzAHP @GFM ONOFF_Trans DX compress	
2)/_/_HzAHP @GPM ONOFF	
CONDENSER FAUS (1)/_/_HzA LS HF @GFM ONOFF	
THER (4) / / Hz A LS HF @ GFM ON OFF	
S) / / Hz _ A L·S HF @ _ GFM ON _ OFF	
OFERATING SCHEDULE: DATE STARTED	

- /													
	<b>/</b> >	Disregard	if	the	item	is	the	same	as	the	GENERAL	BUILDING	DATA

SAT

____ TO

MON - FRI

* PRESENT OPERATION: ____ TO ____ * REQUIRED OPERATION: ____ TO ____

Bldg No. 9-1855

SUN

## *** FMEA_SURVEY_OBSERVATIONS__***

MECHANICAL_EQUIPMENT_DATA	
	FI
AIR HANDLING UNITS:  MANUFACTURER _ IVAIRE CLIMATE MODEL NO. TYPE A  AHU NUMBER: I AHU TYPE: MUTTIZONE  LOCATION: MER basement SPACE SERVED: all the	e Clinic
FAN DATA:  SUPPLY FAN HP: 20 SUPPLY CFM: 20565 STATIC PRESS: 3.  RETURN FAN HP: 47.10/5 RETURN CFM: 15,370 STATIC PRESS: 1.  EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS:  MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A.	5" 25" DISCON
COILS:  HEATING: HW V STM _ DIRECT FIRED> NG _ OIL _ END COOLING: CW V DX _ FROM CHILLER _ FROM DX  REHEAT: # OF COILS _ TYPE _ RECOOL: # OF COILS HUMIDITY: STM _ SPRAY _ ELC _ HW/CW COIL VALVES: 2	TYPE
DAMPERS:  O.A. DAMPER: Y (N), IF YES, FIXED%, MODULATING R.A. DAMPER: Y (N), IF YES, FIXED%, MODULATING E.A. DAMPER: Y (N), IF YES, FIXED%, MODULATING ECONOMIZER: Y (N), IF YES, FIXED%, MODULATING ECONOMIZER: Y (N), IF YES, OA _ RA _ ENTHALFY OA LEAKAGE: Y (N), IF NO, CAN ECONOMIZER BE ADD	5 25% TO 75% G 25% TO 75% G % TO _% (Cooling) ED
FILTER CONDITION: V_GOODFAIRPOOR	_
SYSTEM OPERATION: MON - FRI SAT  *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO	SUN TO TO
HEATING SETPOINTS COOLING S  WEEKDAYS WEEKENDS WEEKDAYS  DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP:  *REQUIRED TMP:  HUMIDIFICATION REQUIREMENTS (RH): 50% HUMIDISTAT LOC	ATION:
SYSTEM SETPOINTS: MIXED AIR 55 'F, HOT DECK75-95'F, COLD TIME CLOCK: YCS (Y, N), IF YES, IS IT OPERATIONAL NO SO'F solpton Chilled Water Return CONTROLS: FNEUMATIC, FNEUMATIC, FNEUMATIC	DECK _A_ F  (Y, N)  /ELEC _V
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(5), FOOR(F) T'S H'STAT COMPR DAMPERS G_ LINKAGES G_ FANS G_ VALVES G_ ACTUATORS G_ BELTS G_ MIXING BOX G_ OTHER	·
COMMENTS: The MZU was docigned with submanter controlle	is forthe zone
mixing values. These hour born disconnected and the de directly controlled by thermostat branch line Pressure. This thouse was made on 27 Oct 78.	only (15tool, othat)
	ge <u>6</u> of <u>14</u>

### *** FMEA_SURVEY_OBSERVATIONS__***

MECHANICAL EQUIPMENT DATA	
HANDLING UNITS:  ONTROL STRATEGY:  10 zones on MZU. 10 pneu. dungor act. Con Type	K
. 4 damper act are inoperable.	
ADDITIONAL AHU/SYSTEM COMMENTS:	
The hosting coil hot water is generated from the ATHW heat	
the booting coil hot water is generated from the HTHW heat exchange located in the MER.  HW Col Capacity = 544,329 BTMH	
HW Cal Caracity = 544.329 BTNH	
The system time clock is disconnected.	
•	
Chilled water is obtained (for the Air Handler) from the DX	
compressor, refrequent converted in a shell and tube heat	-
exchanger.	

FILM #:____ FRAME #:_____

Bldg No.: P-1855

SYSTEM SKETCH:

Page 7 of 14

#### *** FMEA_SURVEY_OBSERVATIONS__***

ECHANIC	<u>AL EQUI</u>	MENT_DA	<u>IA</u>					•	•
		EQUIPME	UT HEA	TING	CFM	HP.	STARTE		ETPOINT
INIT NO.	TYPE	CAPAC	ITY SOU	rice / /					to tomo
	BSDd	<u> 800</u>	BINH//N	en foot	-w/-63	S_ <u>F_E</u> /11	<u> </u>		tertemp,
		Total_	length of	bereboen	d= <u>153</u>	linear	<u>tee7</u>		
			- <del>- 66</del>	d Cyre	14=15	3 × 800	= 122	,4 <u>∞</u> છ	<u> 14 m</u>
		All	perspoor	l loate	ur aus	_cont	rolled by	_local	
			<u>thu</u>	mestate.					
							·		
				·					
						·			
				· 					
ere es es es es es es									
r= T1 hd #4 a		FRAME	#:						
		-					•		
NOTES:		wall 6 SOURCE	furnace	erc.					
			h	t water	r ====================================				stat.
	STARTE	R & CON	IRUL>	o momen 24 v	stat, s	elf co	ntained	. etc.	•

Bldg No.: 1-1855_

Page **3**_of **1**4

#### *** FMEA SURVEY OBSERVATIONS ***

aust fans:  UNIT NO. TYPE  CFM HP & CONTROL SETFORM  LF1 Power Pooferhauster (Toiletech) 700 UNK	:NT 
LEF1 Power Poof exhauster (Toilet exh.) 700 UNK	NT
EF2 (Toilet 4 labert) 2825	
EF3 (MER exh) 800	
EFY (Toilet ext) 100	
<u></u>	

NOTES: TYPE --> propeller, centrifugal, etc.

FILM #: ____ FRAME #: ____

STARTER & CONTROL --> momentary, maintained, line v stat, 24 v stat, self contained, etc.

Bldg No.: 1-1855

Page 9_of 14

#### I. MULTIZONE UNIT AC-1

P-1855

#### A. SF-1 Operation

Supply fan SF-1 and interlocked return exhaust fans REF-1 and REF-2 are normally started and stopped by a seven day timeclock TC-1 chich has spring carry-over feature in the event of a power failure. A manual bypass timer is located in room 7 to allow extended after hours operation. A night low limit thermostat will bypass the timeclock TC-1 to cause both the air handler and hot water pump to operate intermittently to maintain its night setting thus preventing freeze-up. The air handler system AC-1 will shut down any time a freezing or high return air temperature condition exists.

#### B. Damper Control

Enthalpy controlloer E-1 is provided to control fresh air, exhaust air and recirculating air dampers during cooling. The enthalpy control measures the entalpy of outdoor and return air, compares the two and operates the dampers to provide air to somes having lowest enthalpy. During the day cycle, fresh, exhaust and return air dampers are controlled by a mixed air receiver-controller RC-1 set at 55° F. When the unit if off, fresh and exhaust air dampers shall close completely while return air damper will remain open. When unit is on day cycle, the fresh and exhaust air dampers will be prevented from closing completely by a minimum position switch.

20 dd no

## C. Cooling Coll Control

A 3-way modulating valve is provided in the chilled water flow line to the multisone cooling coil. Cooling is controlled by receiver-controller RC-3 which modulates chilled water valve V-9. A panel mounted gradual evitch mounted on the panel door permits adjusting the cold plenum set point between 50°F and 70°F.

### D. Heating Coil Control

The heating coil control valve V-10 is modulated by receiver-controller RC-2 which is reset by the outside air temperature according to reset schedule \$1.

## F Warm Up Control

Warm up controller DR-1 has its genaing element located in the return air duct and is set at 67 F. Controller DR-1 keeps the fresh air and exhause air dampers closed and the recirculating air damper open when the return air temperature is below 67 F.

#### II. TERMINAL UNITS

### A. Multizone Damper Control

Submaster controllers control the mixing dampers at unit AC-1 for each zone.

Page 10 of 14

#### tadiation Control

Page 13

A 2-way valve at each baseboard radiator is modulated by a space thermostat. Where a space thermostat also controls a multizone damper, the radiator control valve and multizone damper are controlied simultaneously.

P-1855

#### C. Cabinet Unit Heaters

A space thermostat modulates a 2-way control valve at each cabinet unit heater. Some cabinet units heater operate simultaneously with hot water or electric baseboard raidators. A strap on thermostat upstream of each control valve prevents the cabinet unit heaters fan from starting when engering water temperature in less then 90

#### III. BOT WATER CONVERTORS

# A. Heating Not Water Convertor HE-1

On normal day cycle operation, 2-way valve V-1 is modulated by receiver-controller RC-5 which is reset by outside air temperature according to reset schedule #2. On morning warm-up cycle, warm-up switch ever controller DR-1 will override the outside air reset and allows full temperature water to the heating system.

## B. Domestic Not Water Convertor HE-2

Receiver-controller RC-4 modulates 2-26 valve V-2 to maintain a supply water temperature of 140°F.

#### IV. PUMPS

#### A. Hot Water Pump A-3

Hot water circulating pump is automatically controlled by time clock TC-1 but bypass timer BT-1 can override TC-1 and either of the two night low limit htermostats can start the pump. The pump will not operate when outside air temperature is above 70°F.

## 3. Chilled Water Pump 4-4"

Chilled water circulating pump is manually started by a pushbutton station in the mechanical room. The pump automatically stops whenever supply fan SF-1 is off or when the timeclock is on night cylce.

#### V. EXHAUST FANS

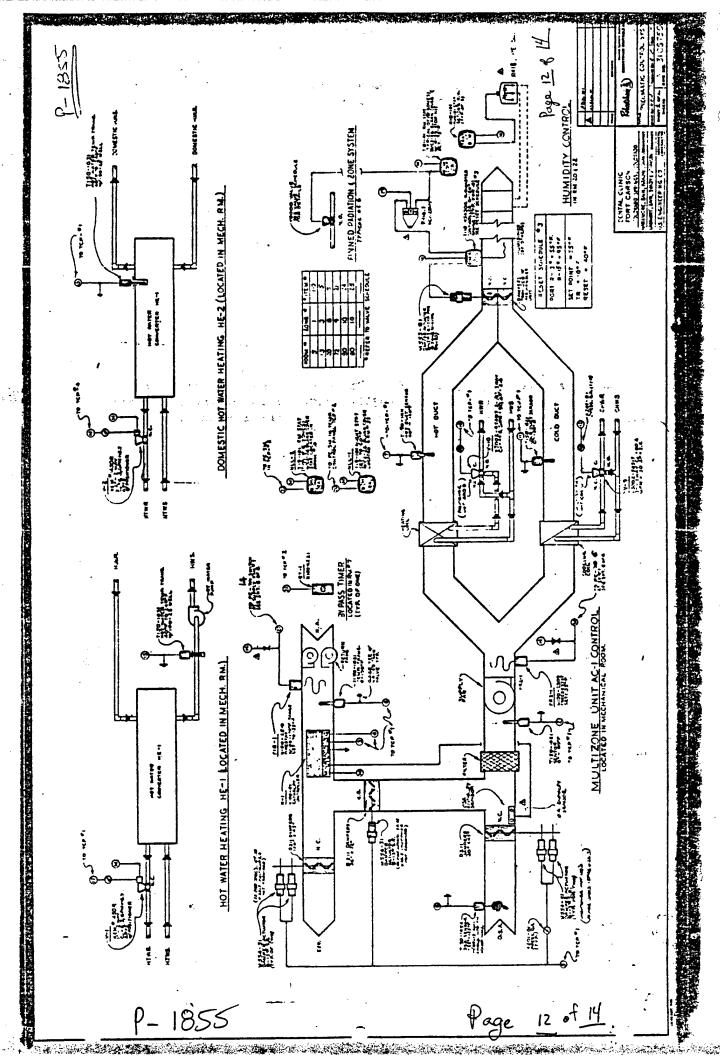
## A. Exhaust Fans EF-1, EF-2, and EF-4

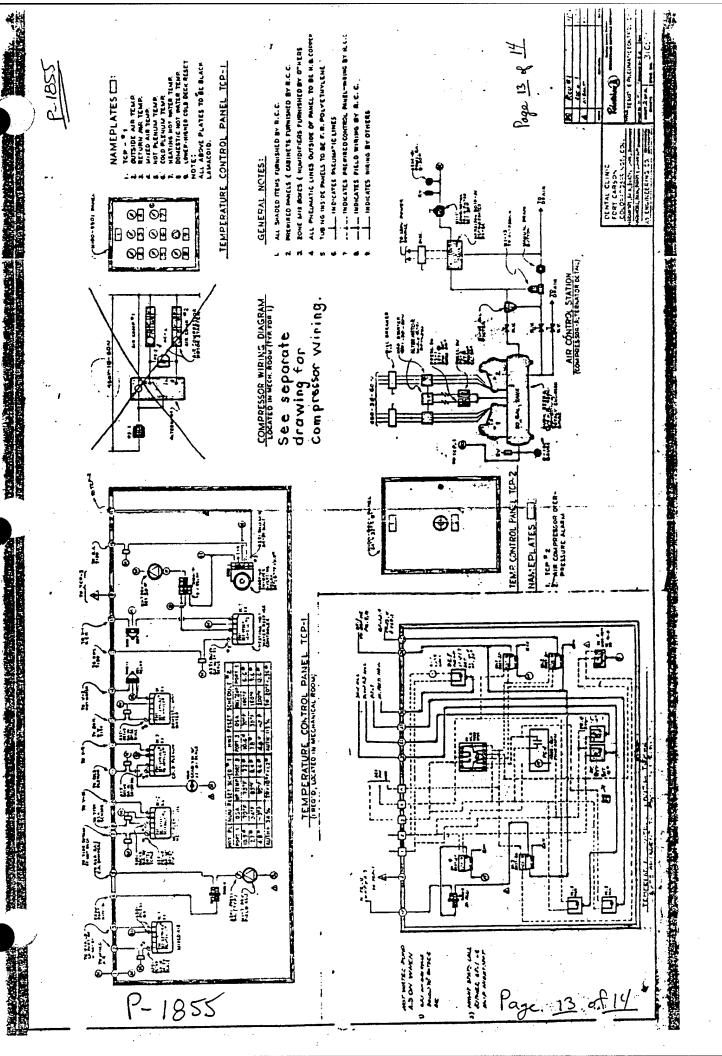
Toilet and laboratory exhaust fans EF-1, EF-2, and EF-4 are started and stopped by timeclock TC-1 or bypass timer BT-1.

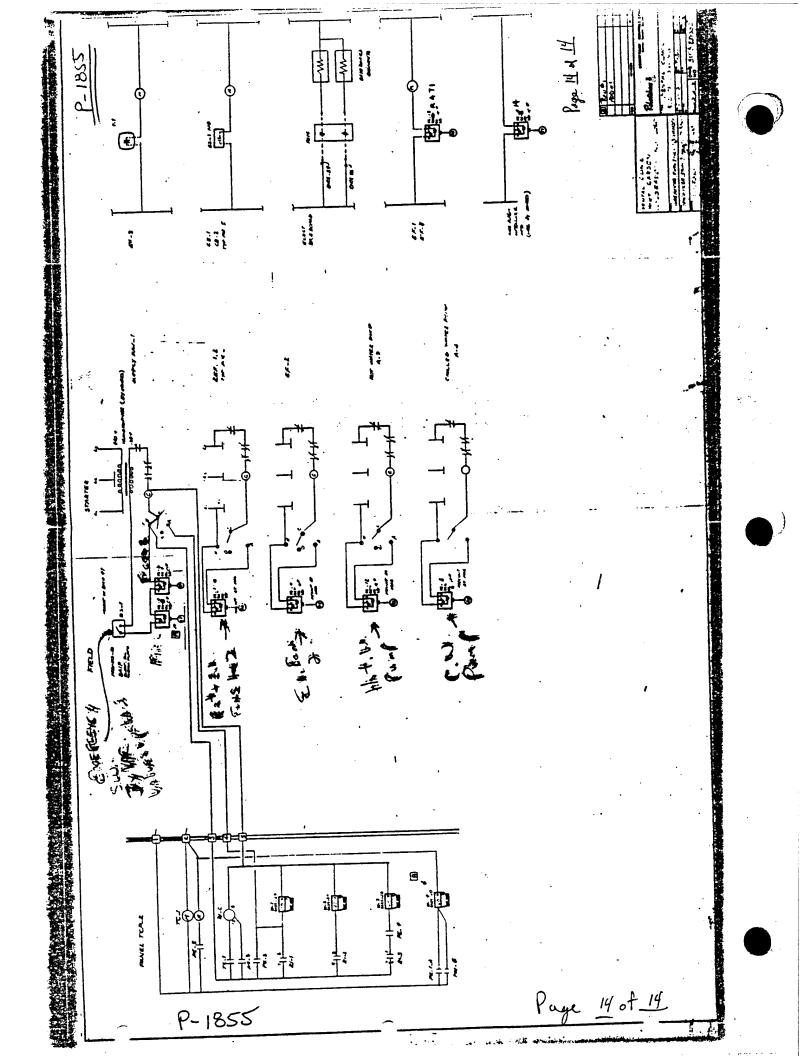
## B. Exhaust Fan EF-3

Exhaust fan EF-3 is started by electric room thermostat T-1 whenever the temperature in the mechanical room exceeds 85 F.

Page_11 of 14







### *** FMEA_SURVEY_OBSERVATIONS_ ***

9/92	
GENERAL BUILDING DATA (ATN/JOE)	
BLDG #: 1864 BLDG NAME: CENTRAL COOLING PLANT JOB #: 174 SURVEYED BY: JEAM 1 DATE: 17/18/85 BLDG CONTACT: NELS MOATS	
CONTACT TELEPHONE NUMBER: 679-6227 BLDG USAGE: CHILLER PLANT TOT BLDG AREA: 6568.0 SF # OF FLOORS: 2 # OF PEOPLE: L	
BUILDING OCCUPANCY: MON - FRI: 0000 TO 1000 FIRST SHIFT:  0600 - 2000 May-Sept: SATURDAY: 11 TO 11 SECND SHIFT:  (7 days per week) SUNDAY: 11 TO 11 THIRD SHIFT:  0700 - 1530 Sept May HOLIDAYS: 11 TO 11 HOLIDAYS:  (7 days per week)  ENVIRONMENTAL CONDITIONS:	
HEATING SETECTIVE COOLING SETECTIVE	=
WEEKDAYS WEEKENDS WEEKDAYS WEEKEND	Ξ
DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 76 76 76 76 76 76 76 76 76 76 76 76 76	HT  
LIGHTING:  AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE  1) 6968 FL 113 1.05 ON OFF  2) ON OFF  4) ON OFF	press.
DATA SOURCE: X_OBSERVATIONASHRAEOTHER SEE ATTACHED SCHEDULE? _XYN	
ELECTRIC EQUIPMENT:  AREA (SF) TYPE (KW) W/SF SCHEDULE  1) 6368 MISC KITCHEN EQUIP NEGLIGIBLE ON OFF  2) CN OFF  3) CN OFF	
4) GN GFF DATA SOURCE: X_OBSERVATIONASHRAEOTHER SEE ATTACHED SCHEDULE?YN	-
INTERNAL MASS: MATERIAL: HEAVY EQUIPMENTESTIMATED MASS: M (L, M, H)	
INFILTRATION: LOCATION(S): WINDOWS, OH DOORS	
ESTIMATED RATE:(L, M, H) or AIR CHANGES or CFM/LIN FT CRACK	
697 ACFM	
GO I ACTIVI	

### *** FMEA SURVEY OBSERVATIONS ***

<u> </u>	-D T 176 - D D T C			,		
SE =	N: DNSTRUCTION		width	HEIGHT	AREA (SF) 1744 3048 7010 3064	<u>0.304</u>
E	ONSTRUCTION BUR/JNS/M	TLDK	WIDTH	HEIGHT	AREA (EF)	
NE **			SP SP SP SP	DP DP		
ARE; PERIMETER SPECIAL ARE; ADDITIONAL R	E: SLAB A: 6968 SF F: 684 LF AS: SUI NOTES: BUI XANI NEX	INSULATION	?Y_ T_SUPA	_NIN	MTW FRO!	·
	FRAME #:					
SKETCHES:						

^{*} Specify in "Additional Notes"

## *** FMEA_SURVEY_OBSERVATIONS_ ***

## GENERAL_BUILDING_DATA

LIGHT:	ING SCHED	ULE						Page _	of
AREA:	(A) MAIN_ (A)	80Cd ×	SF	(B	) ME	zzx	SF		
DATA S	BOURCE:	_DRAWINGS	s	JRVEY T	OUR				
Mark	: #lamps	W/Fix	#Fix	: Flr	# ;		Comments		
	32	253	16	! UP		MACHINE	Room		
	4	<u> </u>	_ Z	1 UP	!	KITCHEN			
	1 2	<u> </u>	<u></u>	! UP		TOILET			
	<u> </u>	35		<u> </u>		TOILET			ander regard through top to different makes
		• '							
	70					PUMP '	Room_	<b></b>	
	 	!!!		: 		~			
	!								
							<b></b>		
		1							
		<u> </u>							millio millio fedden yedde radan rada.
		· · · · · · ·							and the real real residence con-
	; 								
	' 	; 		! 			** ** ** ** ** ** ** ** ** ** ** ** **		
	·			1		- <del> </del>			
(A) TO	TAL:	7329	Watt	:s/		6968_	sf=_ <b>1.</b> 0	5_ W/	SF
(B) TO	TAL:		Watt	:s/		· 	SF=	W/	SF
ADDIT	IONAL NOT	ES: WATT	AGE I	HAS B	EEN	ADJUST	ED ON BO	EP FOI	RM
TO	ACCOUNT	FOR SO	HEDL	JLING.					



Bldg No.: 1864

## *** FMEA SURVEY OBSERVATIONS. ***

드드	NEVAL BI	TENTING :	7010 ·						
סמ	MESTIC H MANUFACT FUEL SOL	JRCE	R: MODEL _{ NAT GAS	ZHEI X	EM STAN ELEC DISTANC	_ OIL E FROM HE	STM GI	EN0' LØFT	THER*
	TYPE	IGHTING	00 00 	SECU	SCHEDULE SCHEDULE JRITY ER*	PARKING	co col	NTROL _ NTROL _ _ ENTRY	
Α <b>Ι</b>	DITIONAL	-	AME #:	Unit Unit I	Heators oils tenters somt,	Honeywell Set at T-STATS H-O-A appears to Hw prom Hw value SO when	Prieuma 250°F- 5 all seu 5 witch 6 have A	tic conti	reller  of  old  hwpunp

Bldg No.: 1864

Page <u>4 of 5</u>

#### *** FMEA SURVEY OBSERVATIONS ***

MECHANICA	<u>AL_EQUIPN</u>	MENT_DATA				
UNITARY H	HEATING E	EQUIPMENT:				
UNIT NO.		OUTPUT CAPACITY	HEATING SOURCE	CFM HP	STARTER & CONTROL	SETPOIN
UHL>5	FC_	LINAVAIL	MTW	UNAVAIL 7/3	<u> </u>	76°
· · ·						
<i>.</i>			****			
			·			
		10				
			<u>-</u>		ومن مناه مناه فيد والله والله على الله على الله الله الله الله الله الله الله ال	
			· • • • • • • • • • • • • • • • • • • •	• •••• ••• ••• ••• ••• ••• ••• ••• •••		==
FILM #: _	F	RAME #:				
		•				

NOTES: TYPE --> unit heater, unit ventilator, duct furnace,

wall furnace. etc.

HEATING SOURCE --> electric, gas fired, cil, steam,

hot water, etc.

STARTER & CONTROL --> momentary, maintained, line v stat, 24 v stat, self contained, etc.

Bldg No.: 1864

### GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

500 TTT 5	414EV 4 1	DATE I A	AICY D	DATE	COMMENTS
ECO TITLE		DATE A	B01	_UAIE_	on Block wells
NSJLATION	A1		B02		
TORM WINDOWS OF DOUBLE GLAZING	A2		-B03		All windows
EATHER STRIPPING and CAULKING	A3			<u> </u>	Door, windows ext. louvers.
nsulated panels			B04	<u> </u>	All Windows
ESTIBULES or REVOLVING DOORS	A5	#_	B05		MA - Troffe Blow
OAD DOCK SEALS (Strip Door or Air Cu)	A6		B06		NIA
EDUCTION of GLASS AREA	N/	l	B07		NIA
EPLACE KITCHEN LIGHT FIXTURES	A8	#_	B08		NA
SHUTDOWN DHW or MOD CTRLS (Non FH)	A9		B09	V	Reduce to no to 105 of
EDUCE LIGHTING LEVELS	A10	1	B11		N/A 1
REPLACE INCANDESCENT LIGHTING	A11		B12		N/A
ISE MORE EFFICIENT LIGHTING SOURCE	A12	#_	B10		NA HES
HIGH EFFICIENCY MOTOR REPLACEMENT	A13		B13		N/A
IGHT SETBACK/SETUP THERMOSTATS *	A14		B14	V	install Hw. Valve on UHs also 68/55
(NFRARED HTRS (Motor Rep Shops & Whse)	A15		B15		N/A
CONOMIZER CYCLES (Dry Bulb Type)	A16		B16		NA
CONTROL HOT WATER CIRC PUMP *	A17	#_	B17		NA
M RADIO CONTROLS	A18		B18		
RADIATOR CONTROLS	A19		B19		N/A
DECENTRALIZE DHW HTRS (POU Htrs) *	A20		В		NA
EAT RECLAIM from HOT REFRIG GAS	A21		B20		N') A
EDUCE AIR FLOW *	A22_	#	B21		NIA.
PREVENT AIR STRATIFICATION *	A23	#	B22		N/A (UH accomplish the
INSTALL TIME CLOCKS	A24		B23		WA
HILLER REPLACEMENT	A25		В		NIA
EPLACE ABSORPTION CHILLER	A26		338		N/A - Procoss equipment.
INSULATE STEAM LINES	A27		B26		N/A
ETURN CONDENSATE	A28		B27		NIA
TRANSFORMER OVERVOLTAGE	A29		B31		3.
TRANSFORMER LOADING	A30		B30		₹
EVISE OR REPAIR HVAC CONTROLS	A31		B32		N/A
NASTE HEAT RECOVERY *	A32	1	B33		MA
ADD ADDITIONAL LIGHT SWITCHES	A33		B35		NIA
WAC INIT/BLDGS WITH SEPARATE BOILERS	A34	#	B37		NIA
STANDARD SOLUTIONS for EXT LIGHTS	A35		B36		NA
BOILER OXYGEN TRIM CONTROLS	TA T	<del>                                     </del>	B24	1	N/A
REVISE BOILER CONTROLS	Ä	<del>                                     </del>	B25	1	N/A
PRE-HEAT DHW	Ä	1	B28	1	NA
HEAT PUMPS	À	#	B29	1	NA
EMCS	Â	<del>                                     </del>		1	
HOT WATER RECIRC PUMPS	Â	<del>  -</del>	M0,17		
HPS STREET LIGHTS	Â	1	M41	<b>—</b>	
ELECTRIC OUTLET INSULATION	Â	<del>                                     </del>	M42	<del>                                     </del>	

Oenotes ECO's studied by Burns & McDonnel
Oenotes ECO's common to Military Family Housing

*** FMEA SURVEY DESERVATIONS ***
7/9/92
GENERAL BUILDING DATA / (AJN/JOE)
BLDG #: P-1955 BLDG NAME: SERVICE MODULE JOB #: 124 SURVEYED BY: Team 1 DATE: 1228/ BLDG CONTACT: SURVISON : CONTACT TELEPHONE NUMBER: QX: 2367 BLDG USAGE: Recruiting TOT BLDG AREA: 2,060 SF # OF FLOORS: # OF PEOPLE! 2 Note: Drawings show 1995 SF BUILDING OCCUPANCY: MON - FRI: 0700 TO 630 FIRST SHIFT: SATURDAY: TO SECND SHIFT: SUNDAY: TO THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
HEATING SETPOINTS COOLING SETECINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 72 72 72 72 72 72 72 72 72 72 72 72 72
LIGHTING:  AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE  1) Z,060 fluorescent and Mcondese to 1.07 ON OFF  2) ON OFF  ON OFF  ON OFF  DATA SOURCE: OBSERVATION ASHRAE X OTHER  SEE ATTACHED SCHEDULE? X YN See page 3 (Est 10% on at night)
PELECTRIC EQUIPMENT:  AREA (SF) TYFE (KW) W/SF SCHEDULE  1) 2,060 Est .25 W/SE ON OFF  2) ON OFF  3) ON OFF  4) ON OFF  DATA SOURCE: X DESERVATIONASHRAEOTHER  SEE ATTACHED SCHEDULE?Y _N  (KW) W/SF SCHEDULE  ON OFF  CN OFF  (Est. 5% on at night)
INTERNAL MASS: MATERIAL: COAC beck ESTIMATED MASS: (L. () H)
INFILTRATION: LOCATION(3): None when for is running The building is pressurized by the fore system.
ESTIMATED RATE:(L. M. H) or Building Volume = 15,960 CFAIR CHANGES OF Building Volume = 15,960 CFCFM/LIN FT CRACK  Assume No Wiltrution due to pressurization
11000012 100 Metal (1)

Bldg No.: P-1955

## *** FMEA_SURVEY_OBSERVATIONS ***

3	Ε	N	Ε	R	Α	<b>L</b> _	Б	U	Ι	L	D	Ι	N	G	D	Α	T	Δ
_	_	_	_	_	-		_	_	-	-	_	_	_		_=	<u>:-</u>		

CONSTRUCTION:  VWALLS: CONSTRUCTION COMPONENT  NE M: 4" Face book, Anspace,  SE E: 2" rigid involution, 6"  SW E: Construct block 1  NW M:	WIDTH 46.33 46.33/127 46.33 46.33/121	HEIGHT 1Z _1Z 	NET AFEA (SF) 483 657.33 483 589.83	Ú-VALUE -0.10 -0.10 -0.10
ROOFS: CONSTRUCTION COMPONENT  Builty last, 3" fixed  Marladon, Acipace, Acoustic  Tile  3in Batt insul. added to ceiling  WINDOWS: AREA(SF) TYPE	WIDTH	HEIGHT	AREA (SF) 1995 	U-VALUE 0.08(  0.091 -0.044
NE M: _73 (R) Aluminum, fixe SE Z:	SF	X DF	DRAPES	 U=1.18 
PERIMETER: 211 LF INSULATIONS SPECIAL AREAS:				
ADDITIONAL NOTES: Approx. 12 of Coulking is in poor condi  Space thermostat is set  temperature reads approx	hon aco to 85°E	and all bat y	hindows. Le space	the
FILM #:FRAME #:				
SKETCHES: (1)(10) + (1)(3) + (2)(30) = 73 SF (1)(0) + (1)(3) + (2)(30) = 73 SF (3)(22.5) $\xi = 67.5$			·	

* Specify in "Additional Notes"

Bldg No.: P-1955

Page Zof 6

## *** FMEA_SURVEY_DBSERVATIONS_***.

### GENERAL_BUILDING_DATA

IGHTING · ŞCHEDULE	•	Fagecf
REA: (A)MAINX	SF	SF
ATA SOURCE:DRAWINGS	SURVEY TOUR	
ark : #lamps : W/Fix :	#Fix / Flr # / Co	mments
14   1   30	6 1 100 walts	(Rocessed Mand)
	8 : 1,440 walts	(Rocessed fluor)
-1/4: 2: 90:	3 : 270 works	( ' ''
-1/2: 1: 10	2 1 20 wats	(exit sign)
2 1 150 1	2 1 1 300 wolts	(Vaportite Mand)
1 1	1	
1 1 .	! !	
1 60	16 ' ' 960 w	(Recessed in cand)
1 60	2 1 120 W	(Incandescent)
1 4 172 1	10 1 1720w	(Recessed fluor)
1 1 47 1	3 1 141w	(Fluorescent)
1 1 10 1	2 1 20 W	(exit sign)
1 1		
	2961. w TO	THE / 2060 SF = 1.44 W/S
	(Typical for P195	6, 1-2055, P-2056, P-2155, & P-21
A) TOTAL: 2210	_Watts/ 2060 Si	
B) TOTAL:		
DDITIONAL NOTES:		



Bldg No.: P-1955

Fage 3 of 6.

### *** FMEA_SURVEY_DBSERVATIONS ***

DENEMBE DOTEDING DATA
MISCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER & MODEL NONE  FUEL SOURCE NAT GAS ELEC OIL STM GEN CTHER*  SUPPLY TEMPERATURE F, DISTANCE FROM HEATER FT  INPUT RECOVERY RATE OPERATING SCHEDULE
TYPE INC NO / SCHEDULE
ADDITIONAL COMMENTS:
<u>·</u>
FILM #: FRAME #:
ADDITIONAL SKETCHES:

* Specify in "Additional Comments"

Bldg No.: P-1955

Fage : 4 of 6

# *** FMEA_SURVEY_OBSERVATIONS__***

## MECHANICAL_EQUIPMENT_DATA

AIR HANDLING UNITS:  MANUFACTURER TRANE MODEL NO. #6 CIMATE Clarger.  AHU NUMBER: AHU TYPE: HOLIZONTAL DIOW TAY.  LOCATION: NER SPACE SERVED: AHI	
FAN DATA: (est)  SUPPLY FAN HP: 1/2 SUPPLY CFM: 3225 STATIC PRESS: 1.5  RETURN FAN HP: RETURN CFM: STATIC PRESS:  EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS:  MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A DISCON	
COILS:  HEATING: HW X STM DIRECT FIRED> NG DIL ELC OTHER  CODLING: CW X DX FROM CHILLER, FROM DX UNIT  REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE  HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY, 3 WAY	
DAMPERS:  O.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING 20% TO 80 %  R.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING 20% TO 80%  E.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO%  ECONOMIZER:(Y, 0), IF YES, OARAENTHALPY  OA LEAKAGE:20 _% IF NO, CAN ECONOMIZER BE ADDEDYEA_(See	
FILTER CONDITION: GOOD X FAIR POOR Signetice of operation	60
SYSTEM OPERATION: MON - FRI SAT SUN *FRESENT OPERATION: CONTINUOUS TO TO *REQUIRED-OPERATION: TO TO	
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PPESENT TEMP:	
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:	
SYSTEM SETPOINTS: MIXED AIR 60 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: N (Y, N), IF YES, IS IT OPERATIONAL (Y, N)	
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC	
EQUIPMENT CONDITION: EXCELLENT(E). GOOD(G), POOR(F) T'STAT  H'STAT COMPR DAMPERS LINKAGES FANS SHEAVES  VALVES ACTUATORS BELTS MIXING BOX  OTHER See note Next 2048	!
COMMENTS: The air handler is in pear condition. The sheet netal	_
- box is severly damaged and is drawing 120% of through	
OA domer due to mateur to me a the des a me is all the	
OA damper due to malfrenchaning controls. This pressurizes the bldg and consumes more energy than necessary.	
P 10-	
Flage Sof $G$	

#### *** FMEA_SURVEY_OBSERVATIONS ***

MECHANICAL EQUIPMENT DATA

AIR HANDLING UNITS: CONTROL STRATEGY: Most of the Conditioned city is dumped into the  Mechanical room while the remainder pressurizes the building.  NOTE: Site investigation on 1-30-85 shows unit operating exectly and  the AHU box is repaired. The unit Continues to	
ADDITIONAL AHU/SYSTEM COMMENTS: pressurize the building to a slight	
the Air handler coil	
B supplied but water  and Chilled water  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB ST  FB	
FILM #: FRAME #:DRAW-THROUGH UNIT CONTROL DIAGRAM NOT TO SCALE  SYSTEM SKETCH:	
DEAW-THROUGH LINIT SPONENCE OF CONTROL AND FINANCE OF	

STARTED MANUALLY AND SHALL RUN CONTINUOUSLY UNLESS RETURN AIR TEMPERATURE AT FIRESWITCH EXCEEDS 125° F OR COIL DISCHARGE TEMPERATURE AT FIRESWITCH EXCEEDS 125° F OR COIL DISCHARGE TEMPERATURE IS BELOW 38° F. OUTSIDE AIR DAMPER CLOSES WHEN AHU FAN IS DE-ENERGIZED. WHEN AN AQUASTAT STRAPPED TO THE CHILLEDHOT SUPPLY LINE TO THE COIL SENSES HEATING WATER, THE ROOM THERMOSTAT MODULATES THE AUTOMATIC THREE-WAY VALVE AND THE OUTSIDE AND RETURN AIR DAMPERS IN SEQUENCE TO MAINTAIN TEMPERATURE. A LOW LIMIT THERMOSTAT IN AHU DISCHARGE SHALL OVER-RIDE ROOM THERMOSTAT TO CLOSE OUTSIDE AIR DAMPER AND OPEN 3-WAY VALVE IF DISCHARGE AIR FALLS NELOW 50°F. WHEN THE AQUASTAT SENSES THE PRESENCE OF CHILLED WATER IN THE SUPPLY LINE TO THE COIL, THE OUTSIDE AIR DAMPER GOES TO MINIMUM POSITION AND THE ROOM THERMOSTAT MODULATES THE AUTOMATIC 3-WAY VALVE TO MAINTAIN TEMPERATURE IN THE SPACE.

Bldg No.: P-1955

	***	FMEA SIMIL	AR BUILD	INGS SURVEY	FORM	***	
GEN"	BUILDI	NG DATA				(9/92 (AJN)	. (
LDG	#:19cle	BLDG NAME:	Det Day	RoomDATE	· 2-13-E	*JOB #: 124	
	USE: Reca	edino # FL	OORS: 1	PEOPLE: ZE	TELEPHOI BLDG AI	NE EXT:	
BLDG		SMTW	Th F S	<u>Ø</u> 6ØØ T0 T0	1630		
-		: HTG: 72/ CLG: 75/		AUTO SETB	ACK: (N) /	Y:/	
Tempo Tempo	erature,Fu erature,Fu	ture, inside ture, inside	, Occupied	1: <u>65/</u> 78 ed: <u>55/</u> —	Temp AirCl	Present: 72 nange/hR: Ø	
ARCH	ITECTURAL		AREA	U-valı	1.0	UA	
1	•		2212	-10		221	
		GLASS ROOF	214 1995	0.044 00	<u> </u>	252 176	
		FLOOR SUM	181.55		<u> </u>	156.13 805.13	
Avg.	Floor-Cei	ling Height	: <u>8'</u> F	loor type:	Slab Ir	sulated: Y/N	
Wir	ow trame to size: _2	ype: Alum Z' x L'5	SP DP	Operable s	sections: Infilt:	sulated: Y/N Y/N ation LMH	(
# 1	y doors:	<u> </u>	Doors: c	<u> </u>	area cond	ittonea: 1000	(
I GH	TING: Type	: Fluoresa	cent	Watts/SF:_	57 U1	il Frac:	
ELEC.	TRICAL EQU	IP: Office	KW/Unit:_	#Units	s: U1	il Frac:	
DHW:	TYPE: NG/	ELEC/CONV	Supply AFUE:	Temp:	GAL/Per	son-Day:	
MECH	ANICAL			<del></del>			
£	Primary S	ystem:	HEA HTHLI -	TING HW CONV	CH	OLING	
	Fuel:		Nag (	CP)	Na	G (CP)	
	Capacity: est.Peak 1	Del.Effic:	63.1%	BTUH	<u> </u>	.12%	
	Months ON		8 2.1.		4	.16/0	
A 1111 -	Hours ON:		5808		- 29	57_	,
AHUs	Hp:			1.0		5 1.0	
	cfm: Min (	0 A •	3225 20%		32	25	
		omizer:			Di	imb	
MISC	:						
	3in. b	cott insul. added	to ceiling.				,e**
ĺ	HW/cu	1 pump = 1/2 H	112.1	(50F.1	705		(
	U.A. re	set control on	pump = HISH	LOWS	<u> </u>		•
1							

	FME	A SIMILAR BUILD	INGS SURVEY FO	)RM ***
# FLOORS: 1	GET RAL BUILDING DA	ATA		(9/92
SMINTHES  SMINTHES  SMINTHES  AUTO SETBACK: (A) / Y: /_  Temperature, Future, inside, Occupied: (65/78)  Temperature, Future, inside, Unoccupied: (65/78)  ARCHITECTURAL  AREA  WALL  CLG: /_ Auto Setback: (A) / Y: /_  Temperature, Future, inside, Unoccupied: (65/78)  AREA  WALL  CLG: /_ Airchange/hR:   AREA  W-value  UA  AREA  WALL  CLASS  214  ROOF  FLOOR  SUM  AVG. Floor-Ceiling Height: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated: YM  Wir ow size: (A)  Floor type: Slab Insulated	DEUG OSE: Admin	NAME: Day Room BLDG CONTACT: # FLOORS: 1	Admin DATE: 2	13-85JOB #: 124 LEPHONE EXT:
Temperature, Future, inside, Occupied: 65/78  Temperature, Future, inside, Unoccupied: 57  AirChange/hR: 67  AREA U-value UA  WALL 2212 - L0 221  ROOF 1955 0000000000000000000000000000000000	BLDG OCCUPANCY: ST	M T W Th F S M T W Th F S	<u> 0600</u> to 10	
Temperature, Future, inside, Occupied: 65/78  Temperature, Future, inside, Unoccupied: 57  AirChange/hR: 67  AREA U-value UA  WALL 2212 - L0 221  ROOF 1955 0000000000000000000000000000000000	T'STAT SETTING: HTG	:/-=	AUTO SETBACK	: (N) / Y: /
AREA U-value UA  WALL 2212 .LO 221  GLASS 214 .LTC 752  FLOOR 1995 .CO LTLC  SUM 2305  Avg. Floor-Ceiling Height: 8' Floor type: Slab Insulated: YM Wir'ow size: 7 x 15 SP DP CURT Infiltration L M I  Litry doors: 2 # OH Doors: 0 2 of Area Conditioned: 100  IGHTING: Type: Fluorescent Watts/SF: 57 Util Frac:  ELECTRICAL EQUIP: OFACE KW/Unit: #Units: Util Frac:  DHW: TYPE: NG/ELEC/CONV Supply Temp: GAL/Person-Day: AFUE: 2  Primary System: HTHW-HW CONV CHW Norths ON: HOURS ON: 4  HEATING COOLING  POLING COOLING  HEATING COOLING  HEATING COOLING  HEATING COOLING  HEATING COOLING  HEATING COOLING  HOURS ON: 52.12%  HOURS ON: 3225 3225	Temperature, Future,	incido Goomaia		Temp Present: 72
WALL GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS GLASS G	ARCHITECTURAL	ADTA		
Avg. Floor-Ceiling Height: 8' Floor type: Slab Insulated: YM Window frame type: Alum Wood Operable sections: Y/M Window size: 2' x 15 SP DP CURT Infiltration L M I # Liry doors: 2 # OH Doors: 2 to f Area Conditioned: Low IGHTING: Type: Fluorescent Watts/SF: 57 Util Frac:  ELECTRICAL EQUIP: Office KW/Unit: #Units: Util Frac:  DHW: TYPE: NG/ELEC/CONV Supply Temp: GAL/Person-Day: AFUE: 1  Primary System: HTHW->HW Conv CHW Capacity: Los KBTILH Capacity: Los KBTILH Months ON: 8 52.12% HOURS ON: 150 150 150 150 150 150 150 150 150 150	GLAS ROOF FLOOT	2212 S 214 1995	1.176 0.044	221 252 176 1716
Primary System:  Fuel:  Capacity: est.Peak Del.Effic: Months ON:  Hours ON:  Hours ON:  HECTRICAL EQUIP: Office KW/Unit: #Units: Util Frac:  #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Units: Util Frac: #Unit	f Litry doors: 2 x	# OH Doors: O	CURT In	Insulated: Y/N ions: Y / N filtration L M H
Supply Temp: AFUE:  Primary System: Fuel: Capacity: est.Peak Del.Effic: Months ON: Hours ON: Hours ON: Cfm: Min DA:  Supply Temp: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-Day: GAL/Person-D	ELECTRICAL EQUIP: O	face KW/IIniti	Watts/SF:	7 Util Frac:
Primary System:  Fuel:  Capacity:  est.Peak Del.Effic:  Months ON:  Hours ON:  Cfm:  Cooling  HTHW > HW Conv  NAG (CP)  NAG (CP)  Second  Hours On:  Second  HEATING  COOLING  CHW  NAG (CP)  NAG (CP)  52.12%  4  7  4  1.5  Cfm:  3225  Min OA:  3225	TYPE: NG/ELEC/C	ONV Supply	Temp: GA	
Fuel:  Capacity:  est.Peak Del.Effic:  Months ON:  Hours ON:  Hours On:  Chkl  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)  NaG (CP)				_
Months ON: 63.1% 52.12%  Hours ON: 6808 -2957  cfm: 3225 3225	Capacity:	- HTHU - PEU	HW Conv	CHK
Hp: 2957 cfm: 3225 3225	Months ON:	63.1%		52.12% 4
$\frac{3225}{3225}$	HUS Hp:	1.5		
	Min $\overline{OA}$	7000		
Dumb		) yes	0.47	Dumb-
11SC:  3 in batt insul. added to ceiling.  O.t./R.A damper motor modula  Low limit set at 40°F  High limit set at 80°F		! added to coiling	Low in	nit sot at 40°E
HW/CW pump = 1/2 HP	HW/CW pump =	12 HP		-
O.A. reset on pump = High 65°F; Low 50°F	- V.M. reset on pu	mp = High 65°F; Low	56°F	

! _	* * * *	FMEA SIMILA	AR BUILDI	NGS SURVEY	FORM	****
GE	L BUILDIN	G DATA				(9/92) AJN)
SUKVLI	: 2056B YED BY: PK USE: Adm	/ET BLUG CL	NIALI:	DATE:	1 E L E P H O N E	OB #: 124 EXT:
BLDG	OCCUPANCY:	SMTWT	h F S	<u>Ø6ØØ</u> T0	1630	
T'STAT	T SETTING:	HTG:/_		AUTO SETBA	CK: (N) / Y:	/_
Temper	rature,Fut	ure, inside, ure, inside,	Occupied	: <u>65/</u> 78 ed: <u>55/</u> —	Temp Pr AirChan	esent: 72 ge/hR: 0
ARCHI"	TECTURAL		AREA	V-valu	۵	UA
-		GLASS ROOF	2212 214 1995 1995	.LØ 1.176		221 252 176
		SUM	1335		$\frac{1}{2}$	365
Nie #	size: <u>7</u> ∵y doors:_	Z × 15 Z # OH	SP DP Doors: <u>⊄</u>	loor type: Soperable Sourt  2	Infiltrat rea Condit	ion LMH ioned: 100
I GHT	ING: Type:	Fluoresc	.ent	Watts/SF:	Util	Frac:
ELECT	RICAL EQUI	IP: Office r	<pre>&lt;\V/Unit:_</pre>	#Units	: Util	Frac:
DHW: MECHA	TYPE: NG/E	ELEC/CONV	Supply AFUE:	Temp:%	GAL/Perso	n-Day:
vw.				TING	COOL	ING
,	Primary Sy Fuel:	/stem:	Nag (		CHW NaG	(CP)
	Capacity: est.Peak l	Del.Effic:	109 K	BTUH	52.1	7.%
	Months ON		8		4	
AHUS	Hours ON: Hp:	•	5808	)	- 295 1.5	
	cfm:		3225		322	5
	Min i Econ	omizer:	20%		20% Dun	
MISC:		<del></del>				
11150.	3in. ba	tt insul. added	to ceiling			
	HW/CW	pump = 13 HP		( ) A		
ا المرسل المالية	O.A. re	set on pump = 1	tigh 65°F; L	ow 65°F		
				· · · · · · · · · · · · · · · · · · ·		

PAGE 1 of 1

	***	FMEA SIMILA	R BUILDI	NGS SURVEY	FORM	****	_
SEI	L BUILDI	NG DATA				9/92 (AIN/J	Œ,
BLDG	.YEU BY: 1/4	BLDG NAME: D L/RT BLDG CO Stirro # FLO	MACT:		TELEPHONE	JOB #: 12	
BLDG	OCCUPANCY	SMTWT	h F S	<u>Ø622</u> T0	1630		
T'ST#	AT SETTING	: HTG:/_		AUTO SETBA		(: <u>/_</u> _	_
Tempe	erature,Fu	ture, inside, ture, inside,	Occupied	: <u>65/</u> 78 ed: <u>55/</u>	Temp f AirCha	resent: 7 ange/hR: 0	
ARCHI	ITECTURAL		AREA	U-valu	ıe	UA	
		GLASSROOF	2212 214 1995 1995	0.046.00 0.046.00		221 252 176 1716 2365	
		ling Height: ype: Alum Z' x 15 2 # OH					
rager		: Fluoresc			•		
ELEC.	TRICAL EQU	IP: Office K	(W/Unit:_	#Units	:: Ut	il Frac:	
1	TYPE: NG/ ANICAL	ELEC/CONV	Supply AFUE:	Temp:	GAL/Per	son-Day:	
	Primary S	vstem:		TING HW CONV	CHk	DLING	
Süabast	Fuel: Capacity:		NaG (			(CP)	<del>_</del>
	est.Peak	Del.Effic:	63.1%	· DILIH		12%	
~	Months ON Hours ON:		5808	<u> </u>	<u>4</u> · 29°	57	
AHUs	Hp:_		1.5		1.6	>	
	cfm: Min		3225		32° 20°		
		nomizer:	20% >			mb	
MISC		,					
		tinsul added to	s cedling				
		pump = 13 HP	Wick 70°E	Loui CCOE	<del></del>		
!	R.A. dan	set on pump =	is connected.	from O.A. dan	ver. Linkaa	e 15 gone.	
	R.A. is 11	n a fixed open i	condition.				

#### E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB	
SHEET NO.	OF
CALCULATED BY J.O.E.	DATE 9/92
CHECKED BY	DATE
COME	

B 2155

AHO runs wit, @ costob H/c wil, Hot with teng in a OAreast. HW

CV was stoked by clanging of setpoint. COV was stoked by

changing of setpoint. (OA setpoint is for changeour and in 70 Fin

this building). CHW CV is writelled by CHW teng. CHW CV has setpoint

adjustment integral to value. Changed the setpoint but walve did not

more. This possibly would be because since CHW is not writed at

this time the CHW teng. is outsided the range of the CV setpoint

adjustment. Piff press. limit on CHW has been disabled. RA

damper has been disabled. OA damper motor is connected but me

did not see it move.

of 7 75: 4 seve E, sick, 3 seve west sick. found 6, stroked those 6.

- 3 are disconnected a linkages don't work.
- 3 appear to work (actuator mores dampse when staked).
  I does not work (linkage looks a K, hat dampse distributions when staked).

****	FMEA SIMILA	R BUILDINGS S	URVEY FORM	***
GE RAL BUILDI	NG DATA			9/92 N.TN
BLDG USE: Adm	LAT BLDG CO	NJ ACT:	TELEPI	HONE EXT:  AREA: 2000 SF
BLDG OCCUPANCY	SMTWT	h F S QGG	TO 1630	<u>)</u>
T'STAT SETTING	: HTG:/_	AUTO	SETBACK: (N	)/Y:/
Temperature.Fu Temperature,Fu	ture, inside,	Occupied: محاصاً	/78 Ter 5∕— Aiı	np Present: 72 rChange/hR: 0
ARCHITECTURAL		AREA	U-value	UA
:: ∰	GLASS	212 214	.10 1.176	221 252 176 1716 2365
:Window frame t	vpe: Alumi	Wood Oper	able section Infi % of Area Co	Insulated: Y/N ns: Y / N ltration L M H onditioned: L
IGHTING: Type	: Fluoresci	Brit Watt	s/SF:	Util Frac:
ELECTRICAL EQU	IP: Office K	W/Unit:	#Units:	Util Frac:
DHW: TYPE: NG/	ELEC/CONY	Supply Temp: AFUE: 2	GAL/I	Person-Day:
Primary S	vetem.	HEATING HTHW → HW (		COOLING
Fuel: Capacity: est.Peak Months ON Hours ON: AHUS Cfm: Min	Del.Effic:	Nag (CP) 109 KBTII 63.1% 8 5808 1.5 3225 20%	H = 1	1HK NaG (CP) 52.12% 1.5 1.5 1.5 20% Dumb
MISC:				
HW/CW	insul added pump = 3/4 HP B ton pump = High between O.A. 9	to ceiling. all & Gossett h 65°F; Low 58°F R.A. dampers is pen; R.A. dampe	missing.	·
_ 6.A. dan	mer currently o	pen; R.A. dampe	ris fixed in o	oon position.

JOB FT CARSON EEAP UPDATE CALCULATED BY AJN E M C ENGINEERS, INC. Denver • Atlanta Germany CHECKED BY MTHW Valve HV units have Separate Hgipum * COMMENTS Act, disconnecte X Pine, 1.5" Value, Type H Actuation. 1's 5 W/ 록 HW/CW & HV Punps 1. STATUS 90 OP 9 90 90 HW/CW Pump 8 90 CONTROLS 300 55 79 55 8 58  $\boldsymbol{\omega}$ 56 × Z = Ŋ = 1116H (8F) 8 59 56 B 62 67 RESET ON GO. VALVE NONE NONE 10.A. Nove NONE NONE NONE NONE 64 9 2 8 FROZEN STATUS 3-WAY CHANGEOVER (C.O.) OP. Teaky Z O Z O  $\frac{1}{2}$ 2 3  $\sigma$ σ. S 9 3 Ō O S7ZE (N.) 40 = = = = = = = × 포 AG. 1798 unable to verity operation ER S × Ξ = Ŧ STATUS 9 90 9 9 P 9 9 90 35 2 90 9 HTHW 2-WAY VALVE SIZE 74 = = = Ξ = = = = × ACT. TYPE = = = = V = = = = ≍ = = STATUS Ħ SIC D S S ≥ \$ \$ 20 S 3 3 Z Z C S T. Z S Z 9 Õ CW 2-W4Y V4LV尼 SIZE (N.) 2,0 2,0 1.5 Ξ =≅ = _ = disconnected Act. operable, =  $\boldsymbol{\Omega}$ = = = _ Ξ == P-2557 2257 P-2058 P-2558 8 P-2457 P-2458 P-1957 P-1958 P-2157 P-2158 205 b BLOG. -22 ø ij

4

ک

1

O P S

SHEET NO. 2 OF 4

CALCULATED BY AJN DATE 9/92

#### E M C ENGINEERS, INC.

Denver • Atlanta • Germany

	,							SCAL							
	Die diconnected	INOP = inoporable	COMMENTS	HVS have pendant mounted T-STATS. 4/5 are broken.	11	K	*	*	И	HVs have utility - type T-STATS W/sensing bulbs,	NVS have utility-type T-STATS Wisensingbulbs in R.A. Stream	=	2	<b>A</b>	=
		Mydd + Spark B.A. / R.A BAMPER	STATUS	N S	=	"	H	И	Н	11	Ų	11	=	¥	N
+c <b>E</b>		Chaidtsp. BANPER	Acs.	a	Ξ	Ξ	11	н	11	3	И	-\$	=	=	=
BUILDING SPACE	ST	( g)	STATUS	2/3 ane DIS	=	=	H	4	=	*	١	ı	1	1	1
1401N	HV UNITS	Piculo 500 -WAY CO VALUE	SIZE (N.)	3=1/2	11	Ξ	Z	X	<u>.</u>	=	3/4"	<b>.</b>	=	11	=
Во	H	(Typica 3-4	Act. Type		H	×	'n	z	2	<u> </u>	None- Manad Bd.V.v.	×	)1	ો	ч
		3-WAY COIL O.A. OAMPER	STATUS	INOP	И	¥	11	И	l)	) ₇	×	ξ	3	Z	н
	Z	O.A.	Act. TYPE	G	¥	ĭ	11	'n	ä	11	ヹ	Z	11	11	, H
	ار الان	Per Bin	STARUS	9/10 are DIS	1(	1/4	ĬI	))	11	l,	1	17	h	11	11
	8 N	alge AY COI 'VE	(N)	72	=	=	14	11	¥	Ξ	=	-	11	1	11
	FAN	S-WAY CTANE	ACT. TYPE	Н	~	H	И	<i>=</i>	ų	=	×	<b>~</b>	V	=	=
		BLDG. No.		P-1957	P-1958	P-2057	P-2058	P-2157	P-2158	P-2257	P-2258	P-2457	P-2458	P-2557	P-2558

	JOB FT CARSON EFEAP	UPPATE
	SHEET NO.	
E M C ENGINEERS, INC.	CALCULATED BY AJN	DATE9/9Z
Denver • Colorado Springs • Atlanta • Germany	CHECKED BY	DATE
Actuator Types	SCALE	10 -
		· · · · · · · · · · · · · · · · · · ·
Type A (HTHW)  Barber - (Ol man Value Operator Mechanism  120V. / GOHZ. / 6.5 Amp / 28 Watt  MP-461-0-0-1  Type F  MV-47302-0-  Type F1  MP-475-0-0-  Type F2	Type F4  MV-2270-0-0-1  Type F5  T	Type C (c.o.)  MC-421-0-6-1  Type D (cw)  MU-47102-0-0-1  Type E (c.o.)  MC-431-0-0-1  1204,0.8 Amp, 50 West
Barber - Colman Hydraulic Actuator 120V./60Hz./0.15Arp/10Watt	(120V; 70 mets)  Type It  Barbar-Colman  Hydraulic Actuator  120V/60Hz/0.135Anp/10mtt  Cart No. MP-5210-0-0-1	Type J MP-5210-0-0-2 1204/60HZ/0.135Arps/10 Barber Colman.

				JOB FT CARSON ERAP UPDATE			
				SHEET NO.		4 of 4	
	E M C EN	GINEERS	S, INC.	CALCULATED BY	AJN	DATE 9/92	
Denver			anta • Germany	CHECKED BY		DATE	
Typica	al Fan Gi	1 Conf	iguration	SCALE			
01.		<u> </u>	· · · · · · · · · · · · · · · · · · ·	1957 1950	7457 7047	2157 2150	
			Diags	2257, 2258	, 2457, 2458	3, 2157, 2158, 3, 2557, 2558	
					(No o.A		
	office		No O.A.		FC		
		FC					
	(0)	(工) i	1	$(\pi)$			
	6 ffike		7	REC	1		
		35	(			· -	
		Nathury.	4 · ·	Faind	+		
	Arms Storage	15/2					
	Storage	(			FC FC		
			Latrine	Storage			
				_O. \$⊅	A. Duct AMPERS		
				•			
			STORAGE				
		-	AREA				
	1			7			
					•		

1 of 3 DATE SOPT. 8-11, 1992 CALCULATED BY AJ.N. E M C ENGINEERS, INC. Denver • Atlanta • Germany FAN COIL UNIT SURVEY P-1958 P-2057 P-2058 P-1957 TESTAT C.V. C.V. T-SVAT BLDG. F.C. C.V. CIVI T-STAT T-STAT SUPATE SUFATE ZUTATUS STATUS STATUS SUFATE 2074TZ No. STATUS AREA. OP D I **S**2 D OP 工 亚 D OP TI D OP I 51 OP D OP D D OP IID OP D INOP D OP 皿 OP D OP OP P OP P OP TT OP I C D OP I D OP 皿 D OP IV OP P(keuty) 工 N1 DP D OP I D OP D OP  $\overline{III}$ P OP D INOP OP TV OP D I D OP N2 P OP II D D 00 OP 开 OP D OP OP NONE INOP IV <-N-≪ D = disconnected P = present & in place N2 N1  $\Box$ S2 51 OP = operable INOP = in operable RLDG. AREA PLAN SUMMARY: ~ 90% of 240 Control Values are disconnected. ~ 10% of 240 T-STATS are broken.

FTCARSON ERAP UPDATE

E M C ENGINEERS, INC. Denver • Atlanta • Germany CHECKED BY ..... FAN COIL UNIT SURVEY SCALE __ P-2158 P-2257 P-2258 P-2157 BLOG. F.C. C.V. T-STAT C.V. T-STAT C.V. T-STAT
AREA NO. STATUS STATUS STATUS STATUS C.V. T-STAT STATUS STATUS AREA OP *S*2 OP I OP OP I OP Ш INOP OP 90 V I OP **S1** OP II Ш OP OP W OP OP 工  $\subset$ I OP OP III OP OP W INOP OP N1 I OP 工 OP Ш INOP OP W

OP

OP

OP

OP

工

I

III

IV

N2

JOB FT CARSON EEAP UPPATE

CALCULATED BY A.J.N. DATE Sopt-8-11, 1992

2 of 3

OP

OP

OP

INOP

CALCULATED BY A. J. N. DATE Sept. 8-11, 1992 E M C ENGINEERS, INC. Denver • Atlanta • Germany FAN COIL UNITSURVEY P-2558 P-2557 P-2458 P-2457 C.V. C.V. T-STAT T-STAT T-STAT BLOG. F.C. C.V. C.V. T-STAT SUFATE SVA7US SUTATO SUTATO STATUS SUTATUS AREA NO. SURATZ SURATZ OP OP NONE OP D **S2** I II OP D OP OP D III D OP OP INOP D D W 90 OP D OP S1 I OP 工 OP  $\mathbf{III}$ OP V INOP D I COP D OP I D OP NONE OP III D OP D OP V D OP D OP N1 I OP I OP Ⅲ OP op TV N2 I OP D OP 00 工 OP D OP D OP III OP OP P D OP TV INOP D OP D INOP

JOB FT CARSON FEAP UPDATE

3 of 3_____

## ***_EMEA_SURVEY_DBSERVATIONS__***

GENERAL BUILDING DATA 3-25-93
BLDG #: 1957(B) BLDG NAME: CADMILESTORAGE JOB #: 174 SURVEYED BY: DATE: 10-22-84   BLDG CONTACT: SCILLIVATI Kolse CONTACT TELEPHONE NUMBER: 579-564549BLDG USAGE: OFFICE STORAGE TOT BLDG AREA: 23, 40 SF # OF FLOORS:   # OF PEOPLE: 60 "
BUILDING OCCUPANCY: MON - FRI: 0500TO 1830 FIRST SHIFT: SATURDAY: TO SECND SHIFT: THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 74* 55:**  THERMOSTAT LOCATION(S): OFFICE WALLS / WAREHOUSE PENDANT HUMIDIFICATION REQUIREMENTS (RH): H'STAT LOCATION(S):
LIGHTING: (Sec prop 4)  AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE  1) ZONEL FL/INC 56 0.35 ON 0500 OFF 1830  2) ZONEZ FL 84 0.26 ON 0500 OFF 1830  3) ON OFF  ON OFF  DATA SOURCE: OBSERVATION ASHRAE OTHER  SEE ATTACHED SCHEDULE? VY N
PELECTRIC EQUIPMENT:  AREA (SF) TYPE (KW) W/SF SCHEDULE  1) ZONEL OFFICE EQUIP. 0.88 ON 0.500 OFF 1830  ON OFF  ON OFF  ON OFF  DATA SOURCE: OBSERVATION LASHRAE OTHER  SEE ATTACHED SCHEDULE?Y N
INTERNAL MASS: MATERIAL: PARTITIONS, BORTESTIMATED MASS: M (L. M. H)
INFILTRATION: LOCATION(S): REAR DBL DOORS - 3/4 TO 1" AT BOTTOM, 3/8" TO 1/2" AT MATE (ZONEZ)
ESTIMATED RATE: H(L, M, H) orAIR CHANGES orCFM/LIN FT CRACK

* ZONE I- OFFICE SPACE ** ZONE Z-STORAGE/ REPAIR SPACE

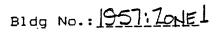
Bldg No.: 1957

Page 1 of 12

# *** FMEA_SURVEY_DBSERVATIONS__***

GENERAL_BUILDING_DATA			Net			
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT N: EXTWALL 1000*	WIDTH. 36:6 35:8	HEIGHT _11'-@_ _11'-@_	AFEA (SF) 392.33 392.33	U-VALUE Ø.Ø622 Ø.Ø622		
E: ZONE Z W: EXMALL 99 *	241'-8"	11:0	2094.33	0.06A5		
ROOFS: CONSTRUCTION COMPONENT	WIDTH 358"	HEIGHT 241'-8"	AREA (SF)	U-VALUE <b>0.0414</b>		
\$\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tinx}\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texitinx}\text{\text{\text{\text{\text{\text{\text{\text{\text{\texitinx}\text{\text{\text{\text{\text{\text{\text{\text{\text{\texitinx}\text{\text{\text{\text{\text{\text{\text{\text{\text{\texitinx}\text{\text{\text{\text{\text{\text{\text{\text{\text{\texitinx}\\ \text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texicl{\text{\text{\texicl{\text{\texitin}\text{\tinx}\text{\text{\texitinx}\text{\texitin}\text{\texit{\texintert{\texintert{\texitint{\texitin}\texitint{\texit{\texitint{\				where these makes their spirit refers		
WINDOWS: AREA(SF) TYPE  N: S: E: W: 564 FXED	SF	DF'	DRAPES DRAPES DRAPES DRAPES	  		
FLOOR TYPE: V SLAB CRAWL AREA: 69861SF	SPACE	_ BASEMEN	T OTHE			
PERIMETER: 313 LF INSULATION	17 <u>K</u> Y_	NIN	2" RIGIT	)		
SPECIAL AREAS:						
ADDITIONAL NOTES: * WALL/ROOF	SYSTE	15 DESC	ribed in			
"BLAST SIMULATION LIBRAR	L HON-	STANDA	RD DEELL	LITIONS,		
ATTACHED						
** EXCLUDES ARMS VAUL	T (5E	E_DWG5				
FILM #:FRAME #:						
SKETCHES:						

^{*} Specify in "Additional Notes"



## *** FMEA_SURVEY_DBSERVATIONS__***

<u>GENERAL BOTLDING DATA</u>				
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT N: EXTWALL 1000 * S: EXTWALL 1000 * E: EXTWALL 1000 * W: ZOUE	WID,TH " 59-10" 50-10" 241-8"	HEIGHT _  '-0"_ _1[-0"_ _1[-0"_	AFEA (SF) (55.17- (55.17- 2656.33	U-VALUE <u>0.0622</u> <u>0.0622</u>
ROOFS: CONSTRUCTION COMPONENT	WIDTH 59-10"	HEIGHT 241'-8	AREA (SF)	U-VALUE <b>00468</b>
WINDOWS: AFEA(SF) TYFE  N: S: E: W:	SF	DF'	DRAFES	  
FLOOR TYPE: SLAB CRAWL AREA: 16098_SF				•
PERIMETER: 361.33 LF INSULATION	17 _ <b>K_</b> Y_	NIN	2" R1910	)
SPECIAL AREAS:				
ADDITIONAL NOTES: * SEE NOTES: ** AREA-INCLUDES ARMS	YAULT	el (See i	2WG5)	
•				
FILM #:FRAME #:				

^{*} Specify in "Additional Notes"

GENERAL_BUILDI	NG_DATA	-		
LIGHTING SCHED			e 7	Pageof
AREA: (A) MAIN_ (A)	<u>6986.11</u> sf	(B) (B) _	E Z 1EZZ <u>  6,09</u> 8	<u>}</u> sf 
DATA SOURCE:	_DRAWINGSS	SURVEY TOU	JR	
Mark ! #lamps	: W/Fix : #Fix	: F1r #	;	Comments
F : 2	186 26	; A		
VI! 1	140 14	' A		
F 1 2	186 428	3	1	<u> 211111111111111111</u>
:	!	1.		in the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second se
F 'Z	186 140	; A	!	
I ! !	1 60 1 ZO	: <u>A</u>		
F ' 2	186 200	: B	1	
	I I			
:	1 1	!	!	
!	1	1	!	
!		1	 	
1	1 1	!	1	
1	· · · · · ·	!	[	
:	1 1	!	<u>                                     </u>	
!	1		1	
(A) TOTAL: _23	396 . Wat	ts/ <u>6</u> 9	86.LL	_SF=_ <i>Q</i> 2.35_ W/SF
(B)TOTAL: 41	28wat	ts/le,	798	SF= <u>0.26</u> W/SF
ADDITIONAL NOT				
(A) TOTAL: 13, (B) TOTAL: 17,	240 watts/69 200 watts/16,	86.11 SF 098 SF =	= 1.9  W/sF $= 1.07  W/sF$	Typical of Co. Admin/Storage Buildings. These numbers do not reflect bulbs that are burned out.

Bldg No.: 1957

IONS
DEFINITIO
NON-STANDARD
LIBRARY
DIMMATION
BLAGT

# PLAST SIMILATION LIBRARY NON-STANDARD BEFINITIONS

# BLAST SIMULATION LIBRARY NON-STANDARD DEFINITIONS

ROOF 41 KF41 21.2722 0.0458  E2 1/2* \$1ag or \$tone 0.0422 19.9044

# MECHANICAL_EQUIPMENT_DATA

/ 54	LANT DES	-010710		HEATING P	LANT					` •
r.			· C -	NTRAL I	<u>JEAT</u>	,				
	EQUIPME TYPE: _ FUEL: N	NT: STEAM AT GAS	3) BOILER HIHW	DIRE CAST I LECTRIC _	CT FIF	ED WATER	STEAM TUBE, OTHE	CONV FIRE TUB	E 	
N/A MI	ULTIPLE SERIES	UNIT OF	PERATION	SEQUENCE	: PARA	ALLEL				
	BURNER	STAGES:								هيد شيد بين سيم
-	-FIF:ING	RATE/FL	/EL:#1:_				#2:			
	BURNER			MFR BLOWER CONTRL MFR			4			
Ļ.	STEA	WATER: M:	SUPPLY RETURN HEADER	SIZE 3" SIZE 3"	TE TE	EMPERATU EMPERATU EMPERATU	IRE 18	DFPRESS DFPRESS PRESS	URE URE URE	PSI PSI
*	CONTROL	- c. TVP	- RAD	BTUH IN BTUH OUT	) EMA	N ELF	CTRIC			
P	LANT AUX FUMPS:	COND	1) Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z	3/60- 3/60- /	A A A	<b>B</b> 3	208- 9.4 HP * HF *	-230/460 -9-2/4. **	ON P	 ACD POMP 47. No. 03- /5955 730001
	FANS:			// //	A A		HP 6		CFM CFM CFM	
		OTHER		/ <u>-</u> /			HF			
6	FANS:	COND	1) ON (() 1) ON 1) ON	: DUI MR/RN OFF OFF OFF	2)0 2)0	NHG 56 NOI NOI	FF FF	ONLY	OFF	
i				#2 OIL		NAT G	AS	OTHER		

Bldg No .: 1957: ZONES LEZ

Page 6 of 12

# *** FMEA_SURVEY_OBSERVATIONS__***

MECHANICAL EQUIPMENT DATA			
	STARTED STOPPED		<b>-</b> -
* PRESENT OPERATION: * REQUIRED OPERATION: _	MON - FRI TO TO	SAT TO _ TO _	SUN TO TO
OTHER FLANT COMMENTS X.	RATED CAPE	KITY" WAS CA	ICULATED FROM
SPECIFICATIONS CONTAI	NED IL "H	OTWATER CON	VERTER SCHEDULE",
SHT M-6, LISING THI	FORMULA	ri Q=Mocpi	
** HW PIMP HEL SHE	PLIES FAN-	COILS/HEATILI	4-100LING
* ** HW PIMP Nº Z SUE	PLIES HĘV	U'3/HEATING	ONLY - in Bldgs
P-2258, P-2457	P-2458, F	2557, 8P-25	58
			·
FILM #: FRAME #:			
SKETCH:			

 $[\]star$  --> Disregard if the item is the same as the GENERAL BUILDING DATA.

#### *** FMEA SURVEY OBSERVATIONS ***

## MECHANICAL EQUIPMENT DATA

COMPRESS CAPACITY CONDENSER: UNIT OPE SYSTEM SER	: TONS A RATION	 IR COO	LED PARALĪĒI	_ WATER L S	COOL ERIES	ED				
COOLING TO MANUFACT TYPE: BLOWERS: DISTANCE CONTROLS &	1) 2) 3) TO CO	 // // OL ING	TOWER F	A@_ A@_ A@_ ROM CHI	No CI CI	. of CE FM FM FM	LLS: _			_
						EVOLIAN				
CAN A ST THIS CAS CW TEM CNW TEM PLANT AUXI FUMPS:	E? PERATUI PERATUI LIARIE: * CHW	RE: SU RE: SU S: 1)_ <b>Z</b> ( 2) 1)	 FFLY FFLY	_'F, RE _'F, RE _ 'Hz _ _ Hz _	TURN TURN A		PIPE S PIPE S GPM GPM GPM	IZEIZEONONON	2NT6FF_ OFF	- IN IN
THIS CAS  CW TEM  CNW TEM  PLANT AUXI  FUMPS:	PERATUI PERATUI PERATUI LIARIE CHW CNW	RE: SU RE: SU S: 1) _20 2) 1) 2) 1) 2) 1) 2)	PPLY PPLY 18_/3/:	1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F, RE 1F	TURN TURN A A A A A A A A A A A A A A A A A A A		PIPE S PIPE S GPM GPM GPM GPM GPM GPM GPM GPM	IZE IZE IZE IZE IZE IZE IZE IZE IZE IZE	2NTFF OFF OFF OFF OFF OFF	IN

Bldg No .: 1957: 20NE 1

Page 8 of 12

WECHANII	JAL_EGUIPM	FMT DOTO					
UNITARY	HEATING E	OUTPUT	HEATING			STARTER	•
UNIT NO.	. TYPE	CAPACITY		CFM	HP	% CONTROL	SETPOINT
0	FLU	3260	(ENTRAL HT	600/475	_16_	JND/Z4V	_ <u>68°</u> _
102		18/240	11	800/570	_11	11	
103		10,170_		1200/1020		<u> </u>	
104		10,165_	11	1000/940			"
				· — — — — — —			
		هندت خودن والآثان فلندب نوست نابج، متواد نستنه					
							· · · · · · · · · · · · · · · · · · ·
	· .					OUTAIUS 5 14 OF 212,17	
	•					11,012,011 11,011,011,011,011,011,011,011,011,	•
		MENT", 70		364-J-E2-2-		GSA GORAL COMM	ES ORLY FOR F C.W. REQUIREMS 0/4
	برط محمد موريد با		/_N4				
(4 T-STA	ETS pour assi	ie area; on	a vara ECU	v £: 44 644		RA · ·	HEATING- COOLING COIL
<u> </u>	10,000	<u> </u>		VIIVEGIL	.   도가시	SUPPLY AIR FAN AUTO, MODULATING 3-WAY VALVE	
						RICM THERMIOSTA	
						COIL-UNIT CONTROL DIAG	EAM E
FILM #:	F	RAME #:	·			O SCALE	ING-COCLING FOOM TYPE
NOTES:		unit heate		entilato	r,	EMOSTAT SHALL MODULATE A THEEF-WAY WI T WATER COIL TO MAINTAIN GOOM TEMPRA	TUTE SET POINT, A STRAF-ON
•		wall furna OURCE>	electric,	_	ec °	JASTAT SENSING THE SUPPLY LINE TEMPERATI THE ROOM THERMOSTAT TO HEATING WHEN OLING WHEN CHILLED WATER IS SUPPLIED, A	HOT WATER IS SUPPLIED AND TO
	STARTER &	CONTROL -			nt £	RMOSTAT SUB-BASE SMALL CONTROL THE FAM  COIL UNIT WITH MINIMUM OUTSIDE AIR:  CE EXCEPT A NGJORIZED DAMPER IN THE CU S RUMBARD, MIRE RESERVED STATES COIL	ONTROL SEQUENCE AS UNIT TUBE ARE CIPENS WHENEVER

Bldg No.: 057:70NEL

Page 9 of 12

WECHANIL	AL EULIEU	EMT_DHTH						مبر
	HEATING E	OUTPUT	HEATING			STARTER	CETOGINI	(22)44
UNIT NO.		CAPACITY		CFM	HF	& CONTROL	SETPOINT	
HYIQL	HEYLL	27,490	CAMPALHI	7400/138Ø	3/4	CAP/LYI	_55°	
HV102	HEVU_	19,740	<del></del>	74000/1000	_94_			
					~~~ <del>~</del>			
				·				
15 SUF	PLIED BY	THESE UN TAL HEATI	lits.Zoue NG CAPACII	Z CONT CY OF 11	TAINS 4,200		1;3EA	
<u> </u>	W4 # 30.	14-02	5HTS_M-5	EG FOR	CON	ITROLS & A	ADOL TRIBO.	
			FAN SAFETY CUT OFF	[PB] ST	Y AIR			
			HEATING	TAN TAN	[sa]			
		 	~ .	Ц 	ı V.	· · · · · · · · · · · · · · · · · · ·		
	_		G-VENTILATING UN	T CONTROL				
FILM #:		,	SCALE MEATING-VEHISLATING UNIT SEQUENCE B MESSENCE OF MEATING WATER IN SUPPLY AND AMOUNTE RETURN AIR & ONT	LIME, MARE 1-STAT SHALL STAR	T SMPPLY 🗸			
NOTES:		wall furt	TATM SPACE TEMP. WILESS FACETESTAT JUMPS, BUTSTILE AND CAMPER CLASES ON LOW LIBHT T-STAT HE DISCH. BYE	SENSES COST. OLSCHARGE TEMP TEM FAM 15 DE-ENERGLEER. ROLDES NO. T-STAT TO GLOSE OF	\$E.00	: furnace,		
	HEATING S		AND SAMPER IF BISCHARGE AND FALLS OF PRES MEATING DEFEN 21 THE PRESENT I 53 PF . 907510 AND SAMPER SMALL GO THE PRESENT AND SAMPLE SAMPLE FAN THE PRESENT AND SAMPLE SAMPLE FAN	M STETEN, AMB OUTSIDE AIR IS . EN 1905 OPEN POSITION AMB CLO	15E P. 1 /	., steam,		
	STARTER &	CONTROL	COMP a medicals. T.			i, line v lined, etc		
		_:	್					

Bldg No.: 1957: 70UE 2

HEATING-VEHTLATING UNIT WITH TWO-VPETO FAM: CONTROL SEQUENCE

ZAME AS ABOVE EXCEPT UNIT FAM BURS ON LOW SPEED IN REATING CYCLE

AND ON HIGH SPEED IN VENTUATION CYCLE.

Page 100f 12

*** FMEA SURVEY OBSERVATIONS _ ***

WECHANTO	JE FRATEL	ENT DETE					
UNITARY (COOLING E	QUIPMENT:	COOLING			STARTER	
UNIT NO.	TYPE	CAPACITY	SOURCE	CFM	HF	& CONTROL	
	ECU	7,110	CELTRALCHW	600/415	16_	MD/24V_	18°
102	(I	12,540_		800/510			
103		15,200_	4	1200/1020			
104	4	14,850		1000/540			
		جن فيد بيد بيد بيد بيد بيد بيد بيد بيد بيد ب					
LEM RAI	iligs Li	TED ARE	MAX/MILL	. ZONE	10	ITAINS 5EA	OE
						PACITY OF	
298.50	BIU/	HR. ALL	FCU'S AL	50 PRI	OVIDE	HEATING	, A5
						<u> </u>	
						<u> ب ت ت ت ب ب ب</u>	
							•
1 1 2 7 7 7							
NOTES:	COOLING	SOURCE>	> moment	gas fi ary, ma	red, d intair	etc. hilled wate ned, line v ntained, etc	stat,

Bldg No.: 1957: ZONE 1

Page 1 of 12

*** FMEA_SURVEY_DESERVATIONS__***

/	CAL_EQUIPM	ENT_DATA					
EXHAUST	FANS:					STARTER	1
						STARTER & CONTROL	
						IND/BALSM	
EF102	ROOF	MER.	.15	265_	FRAC	JUD/T-STAT	_85°_
	·						
			,				
FFLOI	SERVES	5 DILEIS	IN ZON	E_L_E	EJOZ	. 15 NOT CO	NTAINED
-INAU	y zoue.						
						<u>.</u>	
FILM #:		FRAME #:					
				_			
NOTES:	TYPE> STARTER 8	propeller, CONTROL -	-> moment	ary, ma:	intain	ed, line v	stat,

B1dg No.: 1957: ZONE!

Fage 12 of 12

***	FMEA SIMIL	AR BUILDINGS	SURVEY FOR		
	NG DATA	csn l	lilliness _	60 />.	9/92 } :
1:1958	BLDG NAME:	20Admin & Sup	5 DATE : 2	13-8510B	
BLDG USE:	5/50 # FL	OORS: 1 PE	OPLE 22 BL	DG AREA: Z3	500 SF
BLDG OCCUPANCY	: SMTW SMTW	Th F S	01 <u>085</u>	3 Ø	
r'stat setting	: HTG: 10 / CLG: 75 /	AU	TO SETBACK:	N / Y:	_/
Temperature,Fu Temperature,Fu	ture, inside	,0ccupied:65	5/18 55/-	Temp Prese AirChange/	
ARCHITECTURAL		ADEA	U walua	UA	
	WALL	6853.67	U-value ©622		30
	GLASS -	56A.00	10176	(6630	
•	ROOF	23,500.00	.0452	1.042.	61
	FLOOR	674.30	. 86Ø	57.9.	
	SUM			2.712.	<u>Ø 1</u>
	15 × 0H	SP DP CU Doors: Ø	RT In % of Area	filtration Condition //o4	ed: <u>100</u> 0
IGHTING: Type	:Fluoresce	ent wa	tts/SF: 29	Util Fr	ac:
ELECTRICAL EQU	IIP:	KW/Unit:	#Units:	_ Util Fra	ac:
DHW: TYPE: NG/ ✓	ELEC/CONV	Supply Tem AFUE:	p: GA	L/Person-Da	ay:
MECHANICAL			_		
Data and C		HEATIN	<u>G</u>	COOLING	
Primary S Fuel:	ystem:	HTHW > HW	1 cour -	HW LG (CP)	20
Capacity:			BTUH _		
est.Peak	Del.Effic:	6301%		52.12%	
Months ON		8		1	
Hours ON: AHUs Hp:		<u> 5808</u>	Ct-Ct-	2952 5.0	
cfm:	,	20,785	21/21/2	18,000	
Min		10%		10%	 ·
Ecor	nomizer:			Dumb	
MISC:					
	Pump - 3.0	HP 203-220/4	4045 8.9/4.4A	(
				· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·

***	FMEA SIMIL	AR BUILDING	S SURVEY FOR	M ****
Nº BUILI	DING DATA			9/92 45N
DG #:2057 IRVEYED BY F DG USE:	PBLDG NAME: C CO/STO # FL	ONTACT: COL OORS: 1 # P	4 DATE: 7- PLATE TEL EOPLE: 60 BL	13-25 JOB #: 124 EPHONE EXT: 4+39 DG AREA: 188-000 SF
DG OCCUPAN	CY: SMTW	Th F S Q	500 TO 170	<u> </u>
STAT SETTI	NG: HTG: 10°/ CLG: 15°/	<u> </u>	UTO SETBACK:	N / Y:/
mperature, mperature,	Future, inside	.Occupied:6	<u>5/1</u> 8 :55/—	Temp Present: 72° AirChange/hR: 1.5
CHITECTURA	<u>L</u>	AREA	U-value	UA
	WALL		.0622	390,99
£	GLASS -	452.0		531.55
	ROOF	188000		879.84
	FLOOR	577.63	. E/A	496.76
	SUM			2291.66
GHTING: Ty	pe: Fluoresce QUIP: Office	∩t W KW/Unit:	1.07 atts/SF: <u>~2</u> #Units:	Util Frac:
IW: TYPE: N=	G/ELEC/CONY	Supply Te AFUE:	mp: GA	L/Person-Day:
ECHANICAL				
		HEATI		COOLING
	System:		d Conv.	CHW
Fuel: Capacit	V •	Nag (CP 287,480		Nag (CP)
	k Del.Effic:	63.1%		52.12%
Months		6 50 70 7 10		4
Hours 0		5808		7952
HUS Hp		7	57 <i>E</i> ,	A
cf	m:	16,780		14,400
	n OA:	10%		100%
Εc	onomizer:	_ 		Dumb
1sc: 0.74 hr	watch on du	ty in Buil	Ling-	
1;;;:	(-,,)	(220 111/124	<i>O</i> .	•
	CW Pump- 1.5HP	(280/440V)	4.0 12.4H)	
<u>5" /3a</u>	Hinsul. on ceiling.			

LUCK STUTE	AK DOILDINGS SORTE	10
SEK BUILDING DATA		9/4/92 AJN T
DG #:2050 PBLDG NAME: (20 Admin & Sup/4 DATE:	
SURVEYED BY: PK/RT BLDG C BLDG USE: Office/Sto # FL	ONTACT: Pit Couse OORS: 1 # PEOPLE: 20	TELEPHONE EXT: 6157 BLDG AREA: 19900 SF
BLDG OCCUPANCY: SMTW		
S M T W	Th F S 0500 TO TO	
T'STAT SETTING: HTG: 50'/ CLG: 75'/	AUTO SETBA	ACK: N / Y:/
Temperature, Future, inside Temperature, Future, inside	1.0ccupieu:60/16	Temp Present: 84° AirChange/hR: 1.5
•	, onoccupied. <u>55/</u>	Kiri Gutungay initi
ARCHITECTURAL	AREA U-valu	
WALL	6286.0 .062	
GLASSROOF	452.0 1.176 18800.0 .0469	
FLOOR	577.63 . 86	496.76
SUM		7291.66
Avg. Floor-Ceiling Height Window frame type: Alum Wir size: x # E y doors: 12 # OF	:: 9.6 Floor type:	Slab Insulated: YN Nections: Y/N
Wir size: x	SP DP CURT	Infiltration L M H
# E y doors: 12 # 01	1 Doors: 6 7	1.04
GHTING: Type: Fluoresce	ent Watts/SF:	29 Util Frac:
ELECTRICAL EQUIP: Office	KW/Unit:#Units	: Util Frac:
DHW: TYPE: NG/ELEC/CONY	Supply Temp: AFUE:%	GAL/Person-Day:
MECHANICAL	HEATING	COOLING .
Primary System:	HTHW -> HW CONV.	CHM
Fuel:	Nag (CP)	Nag (CP)
Capacity:	287,480 BTUH	
est.Peak Del.Effic: Months ON:	63.1%	52.12%
Hours ON:	5808	7952
AHUS Hp:	7	_4
cfm:	16,780	14,400
Min DA: Economizer:	10%	Dumb
MISC: 24 hr Watch on dud	tu in Building	
· _ HW/CW PUMP - 1.5	11P (206-220/ 0440V; 4	6-4.2/2.1A
3 in Buttingut on ceiling		

FMLA SIM	ILAK BUILDINGS SUKVET	FUKM
EK. BUILDING DATA		9/92
DC 4.2157(P) DI DC NAME	: Co Admin & Sup/4 DATE	AJN/JOE)
LDG #: 215 WEDG NAME	CONTACT: COST LACTOR	TELEPHONE EXT: 2/29
LDG USE: Offices/Sto #	CONTACT: 504 Hoffman FLOORS: 1 #OPEOPLE:	BLDG AREA: 10000 SF
LDG OCCUPANCY: SMT		1630
3 M I	W Th F S TO	`
'STAT SETTING: HTG: 70	/ - AUTO SETB	ACK: (N) / Y:/
CLG: 12	• / —	
emperature,Future,insi emperature,Future,insi	de Unoccupied: 65/78	Temp Present: 700 AirChange/hR:1.5
emperature, rature, rusi	de, onoccupied. <u>55/</u>	Kittellange/lik. 1.5
RCHITECTURAL		•
	AREA U-valu	
WALL GLASS	-6286.0 062 062 062 062	
ROOF	188000 .046	
FLOOR	577.63 86	
. SUM		2291.66
va. Floor-Ceilina Heia	ht. 9 (- Floor type:	Slob Insulated (VIN
vg. Floor-Ceiling Heig indow frame type: Al	um Wood Operable	sections: Y / N
i! 'size: x	SP DP CURT	Infiltration L M H
£ y doors: 12 #	OH Doors: Ø 2 of /	Area Conditioned: 1000
IGHTING: Type: Fluores	cent Watts/SF:	
•		
LECTRICAL EQUIP: Office	. KW/Unit: #Units	s: Util Frac:
HW: TYPE: NG/ELEC/CONV	Supply Temp:	GAL/Person-Day:
· · · · · ·	AFUE: %	
ECHANICAL	4547540	
Primary System:	HEATING	COOLING
Fuel:	NAG (CP)	CHW Nag (CP)
Capacity:	287,480 BTUH	Note (Cr)
est.Peak Del.Effic	: 63.1%	52.12%
Months ON: Hours ON:		4
HUs Hp:	<u>5808</u>	<u> 7952</u>
cfm:	16,780	14,400
Min OA:	70.6	10%
Economizer:		Dumb
ISC:		
_ CW/HW Pump = 2H	Pat 208-220/440V; 6.4/3.2A	
212 0.11 2-11	2/8-	Federal Brooklyn, N.Y. 1-1/40
3in. Bull. insult on ce,	Il Nag.	
AGE 1 of L	·	
01 1		

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB FT CARSON	EEAP UPDATE
SHEET NO.	L OF Z
CALCULATED BY JOE	DATE 9/9Z
CHECKED BY	•
CHECKED B1	

B2157

11111111

4 FC cents on offices up found. Originally, Destrolled FC CVS of fan son continuously. Now, FC CV'S have been disabled and Determs fan on off on lemand. OA dampen as supposed to open of fan on and close of fan De Dt is on only two of the FC'S. We turned these two FC'S off, but the OA dampen so open closed. If the FC'S does not preste when Dealls for it. Stay on Decomplished change over of Dection In one FC This didn't seem To work. The stays on Devas midtled as a marmen so that it describ contact the pipe

Rocommendation:

- A. 1) Connect FC CV's to close when Them for off tweeverse. or \$2) Romone FC CV's altogetter. Law control as in.
- B. Fix OA danger control & FC control on the unit that decent work.
- C. Ryslace moperable strap-on (D'S.
- O lastall night setted (7).
- Deliminate trifit fitting of dampers because theresalot of infiltrator from other somes of because infiltrator things of damper is minimal al for off. On the use new of 2) replace of damper when actually is infilted. Use new of
 - danger w/ seals.

E M C ENGINEERS, INC.

Denver • Colorado Springs • Atlanta • West Germany

JOB FT CARSON P	EEAP UPDATE
SHEET NO.	2 of 2
CALCULATED BY JOE	DATE 9/92
CHECKED BY	DATE
SCALE	

82157 (con4)

H&V Unit on back story over. Far soff @ Tome of surry.

appears to modulate 3-way water. (Voluce los no position indist, so its land to tell).

Upon call for Leat from the D, the OA clamper comes open & RA is closed. Upon call for cooling, the OA clamper 4 RA clamper one modulated to a moved in position. This appears to be

Unit has an HOA milet. The unit was in lot land & auto position.

Its not apparent what controls the far in the auto provition.

Disk, air. (1) so set @ 62 F. When DAT < DA D setporit, dampers ou in mosted air provition. When DAT > DAD setporit, dampers gotte almost 100% OA (sort quile).

***	FMEA SIMILAR BUILDI	NGS SURVEY FORM	***
GENERAL BUILDIN	G DATA	·	(SP/P (NTA
SURVEYED BY: PY BLDG USE: Clice	LDG NAME: CO Admin & C RT BLDG CONTACT: S Sto # FLOORS: L #	14 DATE: 7-13-1 14 SUACE TELEPH 14 PEOPLE: 60 BLDG	ONE EXT: 2933 AREA: 199785 SF
	S M T W Th F S S M T W Th F S	0600 TO 1130	
T'STAT SETTING:	HTG: 85% - CLG: 72°/ -	AUTO SETBACK: N	/ Y: <u> </u>
Temperature,Fut Temperature,Fut	ure, inside, Occupied ure, inside, Unoccupi		p Present: <u>72°</u> Change/hR: <u>1.5</u>
ARCHITECTURAL	AREA	U-value	U A
•	WALL 6286.0		39ø.99
	GLASS 452.0		531.55
		0468:	879.84
	FLOOR 57746	<u> </u>	7391 (6
1			1.60100
Avg. Floor-Ceil	ing Height: 9.6 F	loor type: <u>Slab</u>	Insulated: YYN
- Window frame tv	no. Alum Mond	Onerable section	5: 1 / N
Win' 'size:	X SP DP	CURT INTI	tration L m n
	17 # OH Doors: 6	1 14	
GHTING: Type:	Fluorescent	Watts/SF: 25	Util Frac:
	P: Office KW/Unit:_	•	
DHW: TYPE: NG/E	LEC/CONY Supply AFUE:	Temp: GAL/P	erson-Day:
MECHANICAL	U.F.A	TINC	COOLING
Primary Sy		TING CONV. CH	· · · · · · · · · · · · · · · · · · ·
Fuel:		Na Na	G-(CP)
Capacity:		30 BTUH	
est.Peak D			2.12%
Months ON:		4	52
Hours ON:_ AHUs Hp:	5808		052
cfm:	16.78	<u>0</u> 14	400
Min C			0/0
Econo	omizer: ————————————————————————————————————	Du	mb
MISC:			
CW/HW	pump = 2 HP at 220/440 V	; 6.4/3.2A	
(2.48.9 <u></u>	NER = Htg. OFF/Clg. ON et :		
	TER = MYG OFF/ CIG DN at	, -8 /5	
		· · · · · · · · · · · · · · · · · · ·	

PAGE T of T

. ***	FMEA SIMILA	R BUILDINGS SURV	EY FORM	
BUILD	ING DATA		· ·	9/92) AJN
SLDG #: 77570 SURVEYED BY:++ BLDG USE: OCT	PBLDG NAME: CO SUNTAINA BLDG CO SO FLO	Admin & Sup/4 DA NTACT: Cot Aiggins ORS: # PEOPLE:	TE: 7-13-PF JO TELEPHONE I BLDG AREA	DB #: 124
		h F S 0100		
I'STAT SETTIN	G: HTG: <u>85</u> /_ CLG:75/	AUTO SE	TBACK: N / Y:	/
<pre>[emperature,F [emperature,F</pre>	uture, inside, uture, inside,	0ccupied: <u>65/1</u> 8 Unoccupied: <u>55/-</u>	Temp Pro — AirChan	esent: <u>76°</u> ge/hR: <u>1.5</u>
ARCHITECTURAL	WALL (0186.0 451.0 8800.0	alue 027 39 16 55 468 0.076 8 229	UA Ø.99 31.55 19.84 1,429.16 20.76
AMEIGHTING: Typ	oe: Fluorescen	→ Floor typ Wood Operabl SP DP CURT Doors: Ø % 0	F: 25 Util	Frac:
		W/Unit: #Ur		
DHW: TYPE: NA	S/ELEC/CONY	Supply Temp:%	GAL/Perso	n-Day:
MECHANICAL		HEATING	COOL	ING
Fuel:	System:	HTHW > HW (ON NAG (CP)	V. CHW Nag (c	P)
Capacit est.Pea	y: k Del.Effic:	287,480 BTUH	52.12	%
Months	ON:	_8	4	
Hours O AHUs Hp		<u>5808</u>	<u> </u>	
nnos np		16,780	14,400)
	n OA:	70.6		
Ec	onomizer:		Dumb	
MISC:	1./21.0		l	F-2
	W/CHW Mump	Dell, Heavy Lon	densate in M	CK
		111.14 220 Mary 111	/2 3/	
4 HP H	w/cwpomp - Fan Co	Note in MER.	- Hta OFF / Clash	at 5-6-92

* * * *	FMEA SIMILA	R BUILDING	S SURVEY F	DRM	***
	DING DATA	•			9/92 AJN)
BLDG #: 225 SURVEYED BY: BLDG USE:	BLDG NAME: CE WWYAM BLDG CO ices/Sto # FLO	Admin & Sup NTACT: 15G ORS: 1 # P	4 DATE:- Borden T	7-13-65 ELEPHONE BLDG ARE	JOB #: 124 EXT: 4281 A: 18800 SF
	CY: SMTWT		050 TO 10 TO		
T'STAT SETTI	NG: HTG:85/	<u> </u>	UTO SETBAC	$K: \mathbb{N} / Y$: <u>-/-</u>
Temperature, Temperature,	CLG: <u>75</u> / Future, inside, Future, inside,	Occupied: 6	<u>5/1</u> 8 : <u>5</u> 5/—	Temp P AirCha	resent: <u>14°</u> nge/hR: <u>1.5</u>
ARCHITECTURA	L				
	GLASS	AREA 6286.0 452.0 18800.0 577-63	U-value .0622 L.176 .8468		VA 90.99 31.55 519.84 91.66
wif size:	eiling Height: type: Alum x s: 17 F OH	SP DP C Doors: Ø	URT % of Ar	Infiltra ea Condi	tion L M H tioned: <u>\</u>
腺素LIGHTING: Ty	_				
ELECTRICAL E	QUIP: Office K	(W/Unit:	_ #Units:	Uti	1 Frac:
· .	S/ELEC/CONY	Supply Te AFUE:	mp:	GAL/Pers	on-Day:
MECHANICAL	·	HEATI	nc 	COO	I ING
Primary	System:	HTHW > H	onv.	CHW	
Fuel: Capacit	. V :	Nag (CP 287,480		Nag ((9)
<pre>- est.Pea</pre>	k Del.Effic:	63.1%	2 BIGH	52.1	۷%.
Months Hours (8		4	
AHUS H		5800		<u> </u>	
ci	m:	16,780		14,40	Ø
Mi Fa	in OA:	70.6		10%	2
				Dumb	
MISC:			-		
HW,	Cwpump - 2HP for F	an coils			
No.	Bump for HV units - Bin Batt insul paccil	1 HP 208V/3.	5A		

	****	FMEA SIMILAR	R BUILDIN	IGS SURVEY F	DRM	
GE!	OL BUILDI	NG DATA				(9/92)
SLL.	: 7457(P)	BLDG NAME: Cº	Admines	S DATE:-Z	-13-83	(AJN) - 108 #: 124
SURVE	TED BI: 12K	RE BLDG CON	V I A C I : 'L-\/.	+ 1/2/5/500 I	ELEPHUNE	EXI: 2243
BLDG	OCCUPANCY	: SMTWTH	S S	0000 TO 1	800	,
T'STA	T SETTING	: HTG: 90°/			K:(N) / Y:	/
Tempe Tempe	rature,Fu rature,Fu	CLG: 75°/-ture, inside, (ture, inside, (Occupied:	<u>65/78</u> 0:55/—	Temp Pr AirChar	resent: 72° nge/hR: 1.5
ARCHI	TECTURAL		1051			
			AREA 2853.67		4	UA 26.30
				D	-0.076 .LØ	
		FLOOR SUM	674.30		2.7	12.07
Avg. Windo	Floor-Cei w frame t	ling Height: ype: Alum	9.6' F1	loor type: <u></u> Operable se	(ab Insuctions: Y	ılated: Ŷ⁄N ′/N
Wir #	y size:	ype: Alum x # OH 1	SP DP Doors: <u>@</u>	CURT Sof Ar	Infiltrat ea Condit .04	tion LMH tioned:
I GHT	ING: Type	: Fluorescen	+	Watts/SF:	29 Util	Frac:
ELECT	RICAL EQU	IIP: K	W/Unit:	#Units:	Util	Frac:
DHW:	TYPE: NG/	ELEC/CONV	Supply 1 AFUE:	Temp:	GAL/Perso	on-Day:
MECHA	NICAL		HEAT	TING ,	COOL	ING
	Primary S Fuel:	ystem:	F_WHTH	HW COOU	CHW	
	Capacity:			SO BTUH	Negic	
	est.Peak Months ON	Del.Effic:	63°T%	>	52.12	.%
AHUs	Hours ON:		5808		2952	
V1102	Hp:_ cfm:		8.75 20,78	5	_5.0 _18,00	Ø
	Min Ecor	OA: nomizer:	LØ%	>	LO% Dumb	
MISC:	. ,	1-1		. 11.		
	29 hr W		y in Bu	<u>ည</u> .		
(Zinku oo:	W/CWpump: 1.51 between O.A. & R.A.	HP HW pump dampers is m	for HVunity. Usson on I HVUnit		
		Battinsul. on ceiling				
						

PAGE 1 of 1

FMEA SIMILAR BUILDINGS SURVEY TORM
GENERAL BUILDING DATA AJN AJN
SURVEYED BY: DEFRI BLDG NAME: C=Acmin ESUS DATE: 2 13-85108 #: 124 SURVEYED BY: DEFRI BLDG CONTACT: SET CAMPOS TELEPHONE EXT: 3563 BLDG USE: Offices Sto # FLOORS: 1 # PEOPLE: 20 BLDG AREA: 23500 SF
BLDG OCCUPANCY: SMTWThFS 0000 TO 1800 SMTWThFS TO
T'STAT SETTING: HTG: / — AUTO SETBACK: N / Y: — / —
Temperature, Future, inside, Occupied: <u>65/78</u> Temperature, Future, inside, Unoccupied: <u>55/-</u> AirChange/hR: <u>1.5</u>
AREA U-value UA WALL 6853.67 00622 426.30
GLASS 5(4.00 L.17b (do3.7b) ROOF 73;500.00 -0452-0.016.1,042.61 FLOOR 674.30 .860 579.90 SUM: 2,712.07
Avg. Floor-Ceiling Height: 9.6 Floor type: Sab Insulated: YYN Window frame type: Alum Wood Operable sections: Y / N Window size: x SP DP CURT Infiltration L M H # F y doors: 5 # OH Doors: 5 # Of Area Conditioned: 100
IGHTING: Type: Fluorescent Watts/SF: 25 Util Frac:
ELECTRICAL EQUIP: KW/Unit: #Units: Util Frac:
DHW: TYPE: NG/ELEC/CONV Supply Temp: GAL/Person-Day: AFUE: %
MECHANICAL HEATING COOLING
Primary System: HTHW > HW COOU CHW Fuel: NAG (CP) NAG (CP)
Capacity: 359, Z90 BTUH est. Peak Del. Effic: 63.1% 57.12%
Months ON: 8 4 Hours ON: 5808 2952
AHUS Hp: 8.75 5.0 cfm: 20,785 18,000
Min OA: LØ% LØ% Economizer: → Dumb
MISC: 24 hr Watch on duty in building
HW/CWpump=3HP; HWpump=1.5HP for HV units.
No Bin Butt insul- on ceiling.

	***	FMEA SIMILA	R BUILDIA	IGS SURVEY F	DRM	****
ALF.	L BUILDI	NG DATA				(9/92) LJN
BLDG SURVE BLDG	#: 7557 YED BY: PA	BLDG NAME: Co BLDG CO BLDG CO BLDG # FLO	Admines NTACT: 15 ORS: 1	M 5 DATE: 12 GT BASTICOS PEOPLE: 14	Z-13-25 ELEPHONE BLDG AREA	08 #: 124 EXT: 2055 1: 23500 SF
BLDG	OCCUPANCY	: SMTWT SMTWT	h F S	<u>0630</u> TO _	1730	
		: HTG: 85/		AUTO SETBAC		
Tempo Tempo	erature,Fu erature,Fu	ture, inside, ture, inside,	Occupied Unoccupi	15/78 1:55/—	AirChar	nge/hR: 1.5
ARCH	ITECTURAL			•		11 6
		WALL G	AREA 2853.6	U-value 700622		7.6.30
ા જાણિકોનું પ્ ભૂતારૂદે		GLASS -	56A.00	d 12 17 b	<u></u>	63.26
,			3,500.0		20.076 10	
		FLOOR	674.3	<u> </u>		579.90 12.07
					()	2 - 4 - 6 (1)
Avg.	Floor-Cei	ling Height: type: Alum x 15 # OH	9.6 F	loor type:	<u>olab</u> Insi	ulated: (Tyn Y/N
Wind Wir	ow trame t	ype: Alum	SP DP	CURT	Infiltra [·]	tion LMH
# ·	y doors:	15 # OH	Doors: Q	of A	rea Condi	tioned: 100
LIGH	TING: Type	:Fluorescex	1	/ Watts/SF:	.04 . 29 Uti	1 Frac:
ELEC	TRICAL EQU	JIP: K				
DHW:	TYPE: NG.	YELEC/CONY	Supply AFUE:	Temp:	GAL/Pers	on-Day:
MECH	IANICAL					1.780
30 33	Primary :	Cvetom:		TING THW COOU	CHW	LING
	Fuel:	3y 5 tem		P)	Nag (c	P)
	Capacity		359,7	SO BIUH		
		Del.Effic:	63.12	ь	52.12	-%
	Hours ON	N:	5808		2952	
AHUs		•	8.75		5.0	
	cfm		20,78	5	18,00	<u> </u>
		OA: nomizer:	_LØ%		Dumb	2
	200	1101111201				
MIS						
· ·	Hw/ch	pump = 3HP; H	W pump = 1.5	HP for HVonits.		
. 1 . 1	No3in	Battinsul. on ceilly)			

	***	FMEA SIMILA	R BUILDI	NGS SURVEY	FORM	****
E NE	L BUILDI					(9/92) AJN
3LDG SURVE BLDG	#: 2556 YED BY: A USE: Offices	BLDG NAME: CS FRE BLDG CO STO # FLO	Admine NTACT:S ORS:1	DUS DATE:	TELEPHONE BLDG ARE	DOB #: 124 EXT: 2910 A: 23,500 SF
BLDG	OCCUPANCY	SMTWT		<u>Ø53Ø</u> T0	1745	
T'ST/	AT SETTING	: HTG: 60 / CLG: 75 /	<u> </u>	AUTO SETBA	CK: N / Y	:/
Tempe	erature,Fu erature,Fu	ture, inside, ture, inside,	Unoccupi	ed: <u>55/</u>	AirCha	nge/hR: 1.5
ARCH	ITECTURAL			U-valu		UA
- 		ROOF 7 FLOOR SUM	514.0 3,500.1 1074.3	7	2 0.076 .L.Q	579.90 112.07
# I	y doors:	ling Height: ype: Alum x 15 # OH :Fluorescer	Doors:	CURI	rea Condi	tioned: 100
		IP: F				
DHW:	TYPE: NG/	ELEC/CONV	Supply AFUE:	Temp:	GAL/Pers	on-Day:
MECH	ANICAL		HEA	ATING		LING
	Primary S Fuel: Capacity:		NAG (7 HW COOU. 2P) 290 BTUH	CHW Nag (c	
	est.Peak Months ON Hours ON:		8	/6	57.17 4 2952	
2 U H A	Hp:_ cfm: Min		5808 8.75 20.78 10%		5.0 18,00 10% Dum	X
MISC	: •					
		I/CW pump; 1.5H Battinsul on ceils		n HVunits		
			- <u> </u>			

													EAPUPPATE
							Sł	IEET NO	1 11	_	2 of 2	9-14-92	
	_				IEERS,			CA	LCULATED B	Y <u>M·M</u>	emoger	DATE _	9-14-92
					a • Ge				ECKED BY _			DATE _	
	on	trol Pe	2 to 1.	UY V QU	2 Batta	dion	Bldgs	, so	ALE				
							1						
•			5										
			COMMENTS		1		J _L						
			ž,		8		09						
			රි		Sex at 90°F		Setat60°F		=				
			•		200		1 2					-	
							S	·					
ر ا		₹	STATUS	0	2	7	_	_					
THE LEASE		18. PER.	15	90	22	2	2 3	2 2	_ Z	2 2			
E	HV UNITS	48	F N		বু	F7	3	\	1				
9		0.0	Act. STATE	Щ	T	II.	To To	FTAN	=	L			
1													
		٦	STATUS								•		
	HV UNITS	उँ :											
	Š	3-WAY COIL VALUE	SIZE (N.)										
1 1	?		- 10										
4		M -	Act. Type										
	\dashv	- K			- \$								
		Ty BE	STATUS	Dis	Dang		z		Z	N S			
		Relief OA OAMPER			Nowe (No pumpos		_			ی			
		24	Act. TYPE	F1	Ŋ					7			
		90		17.	≥				7	F1			
<u>w</u>	CNITS		STATUS										
MULTI ZONE		7											
	100	3-WAY COIL VALVE	Size (N.)										
70	#	S-WAY C	1										
V	4	% 	ACT. TYPE										
		(,,	₹ F							 +			
		د وي		P-2350	53		9		0	52			
		BLDG. No.		N	P-1853		P-2060		P-2160	0.2352			1
		<u>ن</u>		<u>a</u>	۵ـ		خ		9	0			
		e					- \	e e a				· - · · · ·	

	٠									#2102-001 FTCARSON FEAP UPDATE						
									SHEE	T NO				_ OF <u>2</u>		
		E	мс	ENGI	NEER	RS. 11	۱C.		CALC	ULATED BY	A.A	liencye	v	DATE	7-14-9	î2_
			ver •							KED BY						
	Cor	ntrol	Point	Surv	vey (Batt	alion	Bldgs.	SCAL	Ε	· · · · · · · · · · · · · · · · · · ·					
			I											.		
		bmmen Ts	·]													
		น พ.พ.ย														
		છે														
		1 5				·								· · · · · · · · · · · · · · · · · · ·		
	<u>a</u>	STATUS														
	Pump	12														
	HW/CW /	Low (F)	-													
	30	E										र्ड				
	*	HIGH (°F)										to				İ
	توند	FO.H										4				
	10. A.	RESEA OU CO VALVE										Sa.				İ
	É	1										<u>ਬ</u>				
	1007	STATUS	3	2	2	Z S	0 P	S Z	DIS			heat				
	100		1					1年 UN DOM deck				3		 		-(
1	\ } }	Srze (N.)	۲:/	≃.	£	=	z	1/4	Ŋ			age .				-
2	当野	AGT. TYPE	-0	F2	M	<>>	۰		8			व्य .				
ME	W#	₹ 1	ଘ	山	F3	F3	α	Ω	<u>a,</u>			y y				
`		\S		_	~	_	>	-				3				
	ls)	STATUS	90	2	S	3	2	2				2 3				
	HTHW 2-WAY VALVE	2 2 2	h				<u> </u>	0				= unable to c				
	س ۲۸ ۷	SIZE (IN.)	0.5	0:1	0'-	7.0	5.0	1.0				ع کج				
	HTHW 2-WAY	Act. TYPE	,	=	=	=	=	=				3.5				
	H 2		٨													
		STATUS	OP	3	N	3	90	a Q				MY				
	>		0	2				٥				<u> </u>				
	-W.	S 12E (ν.)	7.5	z	=	2	=	-								i
	W 2-U VALVE	S 9													·	
	CW 2-WAY VALVE	Act. TYPE	0	=	=	=	=	=								
		~ -		·	0		N									
I., Cara	ģ.	.	Σ	88	06	791	35	700								
r/	BLD6.	No.	P-2350	P-1853	P-2060	P-2160	p-2352	P-2700]
			<u>a</u>	<u>a</u>	<u> </u>	٥	<u>a</u>	هـ								
Ļ		2 . 6 -		2 W 5	r - n	E 4 81	£ ∧ ±	- 4 5 8 5	s % =	,	- on 12 *	8 - N F 4	, e - e		9 ^ = =	

GENERAL BUILDING DATA	(3/25/93)
URVEYED BY: TOPE DATE: 11-20-8 UNITACT TELEPHONE NUMBER: X2011 TOT BLDG AREA: 17373.6 SF # OF F 3 ZONES BUILDING OCCUPANCY: MON - FRI: 410 SATURDAY: SUNDAY: HOLIDAYS:	SLDG USAGE: OFFICES/CLASSES FLOORS: L # OF PEOFLE: LLZ O 1600 O TO LSOO FIRST SHIFT: TO SECND SHIFT:
DAY NIGHT DAY PRESENT TISTAT: 68F 68F	68°F 78°F 78°F 78°F 78°F 0°F 0°F 0°F 0°F 0°F 0°F 0°F 0°F 0°F 0
LIGHTING: 2) AREA(SF) LAMP TYPE 1) 8031.6 FL (12,038 W) 2) 6540 FL (10,443 W) 3) 28180 FL (4510 W) PATA SOUSCE: X OBSERVATION ASHRAE EE ATTACHED SCHEDULE? Y X N	
ELECTRIC EQUIPMENT: AREA(SF) TYPE 1)	(KW) W/SF SCHEDULE ON OFF ON OFF ON OFF ON OFF
INTERNAL MASS: MATERIAL: INFILTRATION: LOCATION(S): Doces, ESTIMATED RATE: (L, M, H) or	ENTRY É DOUBLE ZONE L
AIR CHANGES or CFM/LIN FT CRA	ZONE Z Z174.67 ACFM DAY ZONE Z Z174.67 ACFM DAY 1087.34 ACFM NITE
Bldg No.: <u>P235</u> Ø	20NG 3 939.3 ACFM DAY 469.65 ACFM NITE Fage 1 of 7

*** FMEA_SURVEY_OBSERVATIONS

*** _ FMEA_SURVEY_OBSERVATIONS _ ***

<u>GENERAL_BUILDING_DATA</u>		
4'LWCMU/2'INS/AIRSPC/ N:360 1	IEIGHT AREA(SF) 12.0 432.0 12.0 2618.9 12.0 432.0	U-VALUE • Ø 977 • Ø 977 • Ø 977
TINDIRUCITOR CON CIRCLE	ENGTH AREA (SF) 36.0 8034.12	U-VALUE 0,0468
WINDOWS: AREA(SF) N: E: S: W: FLOOR TYPE: AREA: 80316 SF X SLAB CRAWL SF PERIM: 518.2 LF INSULATION: XY	-ACE BASEMENT	DRAPES DRAPES DRAPES OTHER*
SPECIAL AREAS:		
NOTES:		<u> </u>
FILM #:FRAME #:		
SKETCHES:	•	

*** FMEA_SURVEY_OBSERVATIONS_ ***

CONSTRUCTION: WALLS:					·
CONSTRUCTION 4"LWCMU/2:	N COMPONENT	WIDTH 1 330	HEIGHT	AREA (SF)	u-value Ø_Ø977
		s:610 w:2310	120	732.0 7277.0	Ø.ا77 Ø.Ø 9 77
ROOFS: CONSTRUCTION BUILT UP ROOF, 3" NS		L PAU/1: 163.1_ 2:	40.0	AREA (SF) 6524.0	U-VALUE Ø.Ø368
		3: 4:			
WINDOWS: AREA(SF)		TYPE			
N: E: S: W: 5450	1/4" PLATE			SF DF _ SF DP _ SF DP _	_ DRAPES _ DRAPES _ DRAPES _ DRAPES
FLOOR TYPE: AREA: 652	1.0 sf <u>X</u>	SLAB CRAWL INSULATION:	SPACE	BASEMENT _	_ OTHER*
SPECIAL AREAS:					
NOTES:					
~~~~~~~~					~ <del>*</del> * * * *
·	——————————————————————————————————————				
·					
				·	
FILM #:F	RAME #:				<del></del>
eveteure.			•		

GENERAL BUILDING DATA

# *** FMEA_SURVEY_OBSERVATIONS_ ***

<u>GENERAL_BUILDING_DATA</u>			
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT WIDTH 4"LWCMU/2"INS/AIR SPC/ N: 6'HWCMU E: S:		AREA(SF)	U-VALUE
W: 28	0 12.0	336	0.0977
ROOFS: CONSTRUCTION COMPONENT WIDTH BUILT UP ROOF/3' INS/MTL PAU/ 1: 140.5		AREA (SF) _2618.0 	
WINDOWS:  AREA (SF)  N:  E:  S:  W:		SP DP _	DRAPES DRAPES DRAPES DRAPES
FLOOR TYPE:  AREA: 2818 SF X SLAB CRAW PERIM: 321,8 LF INSULATION:	SFACEN_	BASEMENT _ ZIN _ TO	OTHER*
SPECIAL AREAS:			
NOTES:			
FILM #:FRAME #:			
SKETCHES:	•		

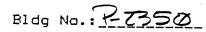


MECHANICAL_EQUIPMENT_DATA	
AIR HANDLING UNITS:  MANUFACTURER TRANE TORRI-VENT MODI AHU NUMBER: L AHU TYPE: MZU BLC LOCATION: MEZ SPACE SI	NU THOU (7.70NE)
FAN DATA:  SUPPLY FAN HP: 7.5 SUPPLY CFM: 18.210 STRETURN FAN HP: RETURN CFM: STRETURN CFM: STRETURN CFM: STRETURN CFM: STRETURN CFM: STRETURN CFM: STRETURN CFM: STRETURN CFM: STRETURN CFM: SWITCH: P.	TATIC PRESS:
COILS:  HEATING: HW X STM _ DIRECT FIRED> N COOLING: CW X DX _ FROM CHILLER  REHEAT: # OF COILS _ TYPE _ RECOOL  HUMIDITY: STM _ SPRAY _ ELC _ HW/CW C	VG OIL ELC OTHER , FROM DX UNIT
DAMPERS:  O.A. DAMPER: (Y) N), IF YES, FIXED _ R.A. DAMPER: (Y) N), IF YES, FIXED _ E.A. DAMPER: (Y) N), IF YES, FIXED _ ECONOMIZER: (Y) N), IF YES, OA X R	Y. MODULATING Y TO Y
FILTER CONDITION:GOOD X FAIRPOOR	
YSTEM OPERATION: MON - FRI  *FRESENT OPERATION: TO TO *REQUIRED OPERATION: TO	_ TO TO
HEATING SETPOINTS  WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT  *PRESENT TEMP:  *REQUIRED TMP:  HUMIDIFICATION REQUIREMENTS (RH): H	WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT
SYSTEM SETPOINTS: MIXED AIR 55'F, HOT DECK TIME CLOCK: (Y, N) IF YES, IS IT OF	
CONTROLS: PNEUMATIC X, ELECTRIC	, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(E), H'STAT COMPR DAMPERS G_ LINKAGES VALVES G_ ACTUATORS G_ BELTS G_ MIXING OTHER	BOX G
COMMENTS: • EXH DM 92 (32"X 110') DAMAGEO	- IMPROPER PUMP (BOLTS SMAM, RETC)
• A4 Q T / . T	. UH RUNNING (100 HOT) TSTHE COCK
· COLL VALUE & DIER (REPL)	HEEMY DEPECTIVE.
· COMY VALUE (REPL) OPE (BEPL)	
Bldg No.: P 2350	Page 5of 7

М	Ε	C۲	IA	Ν	Ι	С	AL	_	Ε	a	U	Ι	F	М	Ε	N	Т	D	Α	T	Α

EXHAUST	FANS:					STARTER	
UNIT NO	TYPE			CFM	HF	& CONTROL	SETPOINT
EF_L	CEUT	TOIL	ETS 3/8"4	815	4/6		
EF_Z_	(ENT_	MER	44"58	1960	1/3		
			**** **** **** **** **** ****				
					·		**** **** **** **** **** ****
							<del>-</del>
		, 				·	
							and their time and arm date and trou
			·				
··· ·· ·· ·· ·· ·· ·· ·· ·· ··							
			• ··· · · · · · · · · · · · · · · · · ·				
					<del></del>		
	ما ووي مين الله علي مين الله علي مويو در						
						·	
rilm ##		HRAME #: _					
K 1(							
IYU . E=1	STARTER 8	propeller, control -	centrifuç > momenta	jal, etc ury, mai	:. ntaine	ed. line v s	stat,

24 y stat. self contained, etc.



#### <u>*** FMEA SURVEY OBSERVATIONS ***</u>

# MECHANICAL EQUIPMENT DATA

HEATING PLANT PLANT DESCRIPTION:  NUMBER OF UNITS:  MAKE & MODEL: 1) SUPPLED BY CAURAL PLANT - HTHW & CHW  2)
3)
MULTIPLE UNIT OPERATION SEQUENCE: SERIES PARALLEL
SURNER STAGES:
FIRING RATE/FUEL:#1: #2: #2:
BURNER TYPE:POWER:MFR MOD No MOD NoCFM  BLOWER/_/ AHP @CFM  CONTRL/_/A ATMOS:MFR MOD No
X HOT WATER: SUPPLY SIZE 3" TEMPERATURE 180 PRESSURE 40 PSI RETURN SIZE 3" TEMPERATURE 160 PRESSURE 40 PSI PRESSURE PSI
RATED CAPACITY: MAX BTUH IN
PLANT AUXILIARIES:  PUMPS: HW 1) 200/3/60-3.4 A  CHW 2) 208/3/60-4.8 A  COND 1)A HP  2)A HP
FANS: 1)/AHP @CFM
OTHER 1)/AHP . 2)/AHP .
AUX OPERATING SCHEDULES: (See Contro(schedule)  PUMPS: HW 1)ON OFF 2)ON OFF  COND 1)ON OFF 2)ON OFF  FANS: 1)ON OFF 2)ON OFF 3)ON OFF  OTHER: 1)ON OFF 2)ON OFF
AUXILIARY FUEL USED: #2 OIL NAT GAS OTHER

# GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

Bldg Name: 280 Adm & ClrmBldg #: 235	Contact	÷	Ph	one #:	Surveyed By: QUO Date:
ECO TITLE	ANNEX A			DATE	COMMENTS
INSULATION	_ A1		# B01	455	INCREASE TO R-28
STORM WINDOWS OF DOUBLE GLAZING	A2		# B02	JES	
WEATHER STRIPPING and CAULKING	A3		# B03	YES	
INSULATED PANELS	- A4		# B04	YES	LOWER PANEL OF VEST, GLAZING
VESTIBULES OF REVOLVING DOORS	A5		# B05	NO	EXISTS
LOAD DOCK SEALS (Strip Door or Air Cu)	A6		B06	. NO	N/A
REDUCTION OF GLASS AREA	A7		B07	YES	45E B 094
REPLACE KITCHEN LIGHT FIXTURES	<b>A</b> 8		#_808_	NO	N/A
SHUTDOWN DHW or MOD CTRLS (Non FH)	<b>A</b> 9			I NO	NO DAW
REDUCE LIGHTING LEVELS	A10		#_B11_	NO	NOT EXCESSIVE
REPLACE INCANDESCENT LIGHTING	A11		# B12	NO	INTIGNIFICANT
USE MORE EFFICIENT LIGHTING SOURCE	Al2		# B10	YES	Ext. incanderent
HIGH EFFICIENCY MOTOR REPLACEMENT	A13		B13	YES	AHU & CIRC PUMPS
NIGHT SETBACK/SETUP THERMOSTATS *	A14		# B14	YES	
INFRARED HTRS (Motor Rep Shops & Whise)	A15	1	# B15	NO	NA
ECONOMIZER CYCLES (Dry Bulb Type)	Al6		# B16	NO	INPACE
CONTROL HOT WATER CIRC PUMP *	A17		# B17	ON'	N/A
TH RADIO CONTROLS	A18		318		
RADIATOR CONTROLS	A19		B19	NO	I N/A
DECENTRALIZE DHW HTRS (POU Htrs) *	A20_		B	NO	NO DHW
HEAT RECLAIM from HOT REFRIG GAS	A21		# B20	NO	N/A
REDUCE AIR FLOW *	A22		# B21	YES	
PREVENT AIR STRATIFICATION *	A23		# B22	NO	NO STRAT
INSTALL TIME CLOCKS	A24		B23_	NO	
CHILLER REPLACEMENT	A25		В	NO	I N/H
REPLACE ABSORPTION CHILLER	A26		B38_	NO	N/A
INSULATE STEAM LINES	A27		B26	NO	NA
RETURN CONDENSATE	A28		B27	NO	N/A
TRANSFORMER OVERVOLTAGE	A29		B31	YEL	
TRANSFORMER LOADING	A30	<u> </u>	B30_	45	
REVISE OR REPAIR HVAC CONTROLS	A31		B32_	YEK	
WASTE HEAT RECOVERY *	A32_		B33	NO	
ADD ADDITIONAL LIGHT SWITCHES	A33_		B35_	NO	
HVAC INIT/BLDGS WITH SEPARATE BOILERS	A34		# B37		N/A
STANDARD SOLUTIONS for EXT LIGHTS	A35		# B36_	NO	
BOILER OXYGEN TRIM CONTROLS	A		B24	NO	N/A
REVISE BOILER CONTROLS	Α		B25	<u> No</u>	NA
PRE-HEAT DHW	A		B28		NO DHW
HEAT PUMPS	A	<del> </del>	# B29		NA HANDLED BY SPECIAL STUDY
EMCS	A		B39 M40	YES	HANDLED BY VELLEN VILLE
HOT WATER RECIRC PUMPS	A			·/+	
HPS STREET LIGHTS	Α		M41		
ELECTRIC OUTLET INSULATION	<u> </u>		M42_		

c>> Denotes ECO's studied by Burms & McDonnel
<#> Denotes ECO's common to Military Family Housing

JOB FT CARSON FEAP	UPDATE
SHEET NO.	
	DATE 9/92
SCALE	DATE

E M C ENGINEERS, INC.

Denver • Atlanta • Germany

P-2350

ATHW

Aguastat T12 Set at 180°F

HTHW 2-way control valve is 12"

Actuator is Type A

HW_

Hw pump - Century AC Motor HZ5B

1 HP Z03-230/460V; 3.4-3.4/1.7Amp

Armstrong pump Mod. H63 / SN. 7806

Hot DECK 3-way control Value - 1/2"
Letinder is Type B

 $\subset W$ 

Cw pump - Wagner Motor 1 2HP Armstrong pump Mod. H63 /S.N. 7512 220/440 V; 4.8/2.4A

Air Side Actuators

O.A./R.A. Damper Act. - Type F Relief Damper Act. - Type F1 (Disabled)

7 Zores on MZU:

Zones 1,3,4, & 6 actuators are connected to linkages. All are openble except #6. Zone TSTATS drive advators. -Ok.

Zones 2,5, & 7 actuators are disconnected from linky as Zones 2 &5 T-STATS are disabled; Zone 7 T-STAT - OK.

E	M	C	<b>ENGI</b>	N	<b>EERS</b>	,_	INC	• .	_
 	'alaa	مطم	Coringe	_	Atlanta	_	Most	Corman	,

132350

multigone AHO w/ 7 yours. aguested TIZ set @ 180, Htg rate VI has from set point To valve activate, sed 170° K. Could not state VI became tayings a 150-230 F. HWT = 72° F. Could not lorde T9 (OA D.) T8 sitzuint is 62F TII sitzount no 75F CHW CV V3 no fred setyout of 48, Studed valuely changing retpoint. There is no heat in the lodg @ time of survey ( Hupungs is of) DP on CHW system has been removed of replaced in / a garage. Fan Las H-O-A switch ond is running in the auto position HW pump so met operated by TP or TII ( stocked lott setports) pung ded not time off.) Strobed T8 and CHW prings 81 tumal of and U3 closed. Stroled 711 & dampers did not move. lould not find T2. Since there we het or of hed ded valer. Ish, dampe is not connected to note minimal eff. an.

	* * * *	FMEA SIMILA	AR BUILDI	NGS SURVEY	FORM	***
	VE BUILDIN					9/92 AJN
BLDG SURVE BLDG	#:1853/16 YED BY: 24 USE:Offices	BLDG NAME: Br <del>/ Classos #</del> FLO	Admin & Cla INTACT: LA DORS: 1.1	MARC DATE:	7-13-85 TELEPHONE BLDG ARE	JOB #: 124 EXT: 4436 A: 22900 SF
BLDG	OCCUPANCY	SMTWT	h F S	<u>0500</u> TO	1700	
T'STA	AT SETTING:	: HTG: 68/ CLG: 75/		AUTO SETBA	CK: N/Y	: _/_
Tempe Tempe	erature,Fut erature,Fut	ture, inside, ture, inside,	Occupied	:165/78 ed:55/—	Temp P: AirCha	resent: <u>68</u> nge/h <u>R:.53</u>
ARCHI	TECTURAL		AD5 A	11 7	_	
		WALL	AREA	<u>U-valu</u>		UA
		GLASS -	7,850 545	1.091		18.0
		ROOF 7	7,376	0468		813.
		FLOOR	700	960		602.Ø
		SUM Z	6,511		2,	774
Avg. Windo Windo	Floor-Ceil w frame ty w size: ry doors:	ling Height: /pe: Alum x # OH	\bullet \lambda \infty \lambda \lambda \infty \frac{1}{\text{Vood}} \ \text{SP}  \text{DP} \\ \text{Doors: \bullet \infty}	loor type: Operable s CURT 5 % of A	Slab Instections: Note of the Infiltration Conditions of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infiltration of the Infil	lated: Y/N / / N tion ① M H tioned: <u>l</u>
LIGHT	ING: Type:	: Fluorescer	74	Watts/SF:	1.6 Uti	Frac:
ELECT	TRICAL EQUI	IP: K	W/Unit:_	#Units	: Uti	Frac:
	TYPE: NG/E	·	Supply 1 AFUE:	Temp:	GAL/Perso	on-Day:
MECHA	MICAL	•				
	Drimany C.	(		TING	COOL	ING
	Primary Sy Fuel:	/stem:		the Conv	- CHKI	40)
	Capacity:			P) KBTUH	Nac (	<u>((F)</u>
		el.Effic:	(03.1%	PDIGH	52.12	•/
	Months ON:		8		4	
	Hours ON:		5808	)	Z957_	
AHUS	Hp:		15			from Numeplate)
	cfm:		24.87	<u> </u>	13,67	<u>න</u>
	Min 7	omizer:	56%		20%	
	LCON	JIII 2 E I •			Damp	
MISC:	,					
_ •	24 W./Ga	und on Dut	tu (3 me	$\sim$	•	
	1-57U A	or Rifle Ran		atmo only,	11200 CF	MOSHP.
	7000%	OA:	ک	رد ع		
			<del></del>			· ·
		<del></del>			•	

PAGE L of L

CALCULATED BY AJN E M C ENGINEERS, INC. DATE 9/92 Denver • Colorado Springs • Atlanta • Germany D-1823 Control set pt-O. A. deinpers - 74° = Operable Linkage is removed (18") 7-12 - 58°F Operable Controlled from Mixed Air Sersor sedpoint on Actualm. 62°F Unable to operate Relief Air Duct is disconneded & HW Props capped off wy poly ethylene at the No. 2 Switched OFF flex joint. Hupung No.3 is 12 HP serves AHUDO, 2 Verified Control pts from Control Schometics in MER. The following differences exist: 1) ALUZ has an extra dumper that Charles Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of the Control of th will o ch a damper to the MER. It x dan dest Clacery The Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of the Sylven Company of WIN ELE JOHN OU HOM MER ETT & W ENDER) OP OP OP OP OP OP O.A. To Mointain a desired M.A. selfin Act. Motors = MA 405 (MER AIL) - Type Bon O.A. Zi) AHUZ is not used. Fiving range is a lead & asbostos hazard. Has not 4.C(58°F) been used for a coupledyear. : u mostly lacked up. Brief Comm Contains CONVARTOR A ZOOF (B) 200 F (B) 20°F Besut is locked & OFFLinds Lead & asbestos contamination.

JOB FT CARSON EEAP UPDATE

*** FMEA SI	MILAR BUILDINGS SURVE	· · · · · · · · · · · · · · · · · · ·
ENERAL BUILDING DATA		(9/92) (AJN)
URVEYED BY: HAW AM BLD LDG USE: Offices / Classes #	E: BAZMIN & CITM/RE DATE G CONTACT: 55 Merrill FLOORS: 1.1 # PEOPLE: 6	E: 7-13-85 JOB #: 124 TELEPHONE EXT: 4933 BLDG AREA: 72900 SF
LDG OCCUPANCY: SMT	W Th F S W Th F S TO	0 1700
'STAT SETTING: HTG: 6		BACK: N / Y:/
emperature, Future, ins emperature, Future, ins	ide, Occupied: 65/78	Temp Present: 68 AirChange/hR: 63
RCHITECTURAL	ADEA II wa'	3a
WALL	AREA U-va 7850 .091 545 L.176 17,376 .046 700 .86	718.0 641
indow frame type: A ir v size: x y doors: 5 #	lum Wood Operable SP DP CURT	:Slab Insulated: Y/N sections: Y / N Infiltration (DM H Area Conditioned: 100)
IGHTING: Type: Flyore	scent Watts/SF	: <u>1.6</u> Util Frac:
LECTRICAL EQUIP:	KW/Unit:#Uni	ts: Util Frac:
HW: TYPE: NG/ELEG/CON	Supply Temp: AFUE: %	GAL/Person-Day:
ECHANICAL	HEATING	COOLING
Primary System:	HTHKI - HKI Conu	CHW
Fuel:	Nag (cp)	NaG (CP)
est.Peak Del.Effi	115.5 KBTUH c: 63.1%	52.12%
Months ON:		4
HUS Hp:		
cfm:	24.879	13,670
Min OA:	56%	20%
Economizer:_		Damb
ISC:		
· 24 hr bound on	Outy (3 men)	11700 00 00 00 00
1.570 for 121+12	Kange is heating onl	4,11,200 cfm @ 5HP,
OA Stat setpoint	= 85°	· · · · · · · · · · · · · · · · · · ·
· Roof has R-19		
•		

AGE 1 of 1

JOB	FT CARSON EEA	IP UP DATE	
SHEET	NO	OF	
CALCU	LATED BY AUN	DATE 9/92	
CHECK	ED BY	DATE	
SCALE			

# E M C ENGINEERS, INC.

Denver • Atlanta • Germany

P-2060

Similar To.P-1853 (see Schenafics for 1853)

T14 sist at 750 (HWpump)

DPI is disconducted.

V4 is set at 50°F (per marking cu sensor is disconnected on value)

TIZ set at 58°F (en pump)

Mixed Air Tenp. set at 60°F

Wostinghouse Circula Chart Temperature Recorders:

I for HW & I for CW

Barber (	Colmen Controller
?	Converten
(A) 950	A) 98°
(B) 70°	(B) 70

AHU1

Century Motor

Conting Motor

7.5 HP at 200-208 V; 5HP 200/208V 23.0-23 ÓA

16.0/16DA.

6-330778-01

CW pump 1/2 HP Maruthon 208-220/4404; 4,8/2,4A

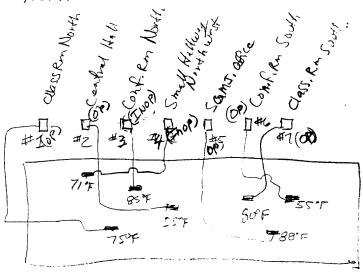
Hw pump

5 HP 208-220/GusV; Marathon 12.0/6.0A

HW Pump for Atto = ( Fing Page) 13HP (Duyton)

2"C.V. for A = > Z & m4 advator is 3-Wag. w/ Act. No. mp-367-0-0-1. MP-387-0-0-1

AHU#2 has same damper actuators as found in P-1853,



Firmy Karge area nosineer award of load? as bestos. Is being converted to office space. T-STAT is inoperable. ( see sketch on back side of page.)

	***	FMEA SIMIL	AR BUILDI	NGS SURVEY	FORM	***
EN	L BUILDIN	NG DATA		•		9/92 AJN
URVE LDG	YED BY: +H USE: Offices	BLDG NAME: B <del>JAM</del> BLDG CO Classos# FLO	nAdmin ECIr ONTACT: SF OORS:1.1	M/RO DATE: C KENT PEOPLE:	7 13-86 J TELEPHONE BLDG AREA	OR # · 124
LDG	OCCUPANCY:	SMTW	Th F S	6600 TO	1700	
		HTG: 68/		AUTO SETBA		
empe	rature,Fut rature,Fut	ure, inside ure, inside	Occupied: Unoccupie	(65/78 :0:55/-	Temp Pr AirChan	esent: <u>68</u> ge/hR: <u>.53</u>
RCHI	TECTURAL	·	A D F #	#		
		FLOOR	AREA 7850 545 7,376 700 6,511	U-valu -091 L.176 -0468 -860	7 6. 81	UA 18.0 4/ 3 .02.0 774-
ir	size: y doors:	<u>€</u> # 0H	SP DP ( Doors: Ø	CURT 2 of A	ections: Y Infiltrat rea Condit	/ N ion ① M H ioned: <u>  /</u> ////
		Fluorescen		•	•	• .
	•	P: K	(W/Unit:	#Units:	Util	Frac:
	TYPE: NG/E	FEC\COHX	Supply T AFUE:	emp:	GAL/Perso	n-Day:
ECHA	NICAL		HEAT	ING	COOL	ING
-	Primary Sy Fuel: Capacity: est.Peak D Months ON: Hours ON:	el.Effic:	HTHW→H NaG (CG 715.5 ¢ 63.1%	K Conv	CHW NGG ((	
HUs	Hp: cfm: Min O	A: omizer:	5608 14 10.5 24.879 56%	<b>D</b>	20% 13,670 20% Dumb	5
'SC:	24 M Ga 1-57-U ( 254P, 10 300 CW PUMP HW PUMP	For Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Rifle Roman Ri	ty (2 me)	n) eating On	ly; 11,200	O CFM(A)
ĞE	L of L					

# 

#### E M C ENGINEERS, INC.

Denver • Atlanta • Germany

P-2160

Same as P-1853

AHU#1 Century Motor 7.5HP (Same as 2060)

AJAX Elect. Mador CO. 3.0HP 230/460V, 9.0/4.5A

Marathon. 1,5 HP (same as P-2060)

Eddor 15 HP 203-270/445 V 4.6-4.2/2.1A HW Pump for HV Unit (Firing Rame) Bell & Gossett 1 HP 230/460 V 4.6/2.3A T14 set at 70°F T12 set at 58°F M.A. Temp. set at 60°F DPI connected

SCALE _

All controls connected as per diagram, except there is no, relief.

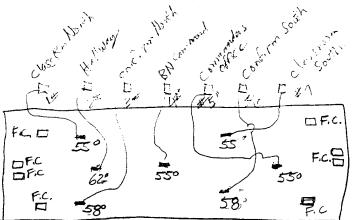
damper à actuator.

AHU#Z has same.

damper actuators as
P-1853 except has
an erta D.L. damper Let.
MP-461-0-0-1 to Help
more damper.

Controller Set pts
(?) Converter
(A) 60° (A) 60°
(B) 60° (B) 60°

All 7 zone damper Actuators are MP-2150-500-7-2 Barber-Colman Electric.



Al zone Advitois are operable.

Fan Cott units are the Same as Bldg. P-1853

The transfer of the state of the second contract of the state of the state of the second contract of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the sta

Lead/Asbastos

abalementis in

progress in Basement

Firing range.

No access at

correct time.

	***	FMEA SIM	LAR	BUILDIN	GS SURVEY	FORM	***	A. 5.
3E	AL BUILDI	NG DATA	•				(9/9Z) (AJN)	
3LDG SURVE 3LDG	#: 2352(P) YED BY: 441 USE: OFFICE	BLDG NAME:	ZBO CONT LOOR	Actining(	Im DATE:	7-13-85 TELEPHONE BLDG ARE	JOB #: 124 EXT: A: 18672_SF	
LDG	OCCUPANCY	SMTI	/ Th	F S F S	0600 TO TO	1730		
T'STA	AT SETTING	: HTG: 62	<u>/-</u>		AUTO SETBA	CK: N/ Y	:/_	
Tempe Tempe	erature,Fu erature,Fu	ture, inside	le,0c	cupied:	65/18 d: <u>65/-</u>	Temp P AirCha	resent: 6	
ARCHI	TECTURAL							
				AREA	U-valu		UA	
	•	WALL		1890		<u> </u>	121	
		GLAS3_	-10	543_		<del>2</del>	913	
		ROOF FLOOR	_17	3/5	- 7276	<del>-</del>	470-	
		SUM	76	37/		7	224	
							ulated: Y/N Y / N tion ① M H tioned: Lety	\ <u></u>
							1 Frac:	
	TYPE: NG/							
	·	EEEC/ OON +-	Ā	FUE:		uni/icis	on-Day:	
MECH	ANICAL			HEAT			LING	
	Primary S	vstem·			W Conu	CHW	LING	
	Fuel:	J 5 CC	- <del>~</del>	Jag (C		NAG	(CP)	
	Capacity:	·			144.77			
		Del.Effic	<u> </u>	3.1%		52.1	7.	
	Months ON			3		4		
	Hours ON:			3808		<u> </u>		
AHUS	Hp:_			7.5 10		100 31	10	
	cfm: Min			18,210		70%	10	
		omizer:		ZØ%			set = 80° F	
	20011	O					<del>21 - CV   1                                   </del>	
MISC	:					-	•	
•	17tone							المعقور
	_ CW pung					·		
	- HWPUM	o - 3/4 HP	•					,
			· · · · · · · · · · · · · · · · · · ·					
				·				

PAGE 1 of 1

# JOB FT CARSON EEAP UPDATE CALCULATED BY AJN DATE 9/92 CHECKED BY ___

# E M C ENGINEERS, INC.

Denver • Atlanta • Germany

P-2352

See Control Schondis for P-2350

CW pump.

Wagner

1/2HP

208-220/440V

4.8-4.8 Z.4A.

Hw pump

Baldor

3/4 KP

208-230/460V

3.2-3.0/1.5A

T12 set et 160°F

T8 (CWPV-p) setat 60°F

TII (Economizen) Setat 85°F

V1 setat 1509

Hot Deck Value. Barber-Colman Contriller 65°F (B)

MultiZone Atto Confuny 10HP . 200 /208V 29.0/29.0 A Colman MU-2270-0-0-1 83°F

	***	FMEA SIMI	LAR BUILDI	NGS SURVEY	ORM	***
	VE BUILDI			,		9/92 (AJN)
BLDG	#:2100 P EYED BY: 2 USE: BUTTLE	BLDG NAME: T/PK BLDG 5/Classed F	BrAdur&C CONTACT: E LOORS: 1	- I'm DATE:	ELEPHONE BLDG AREA	108 #: 124 EXT: 2288 N: 12339 SF
BLDG	OCCUPANCY	: SMTW	Th F S	<u>\$7\$\$</u> TO	<u>1630</u>	
T'ST	AT SETTING	: HTG: 72 CLG: 75	/	AUTO SETBAC	K: (N) / Y:	_/_
Tempo Tempo	erature,Fu erature,Fu	ture, insid	e,Occupied e,Unoccupi	: <u>65/18</u> ed: <u>65/</u> –		resent: <u>70</u> ige/hR: <u>-53</u>
ARCH	ITECTURAL					
		WALL	AREA 5717	U-value 10.091		UA 14.5
		GLASS ROOF	3 <b>2</b> 7 _//482	0.0468		37
		FLOOR SUM	444	-860		81.8
_			17,470			
Wi	ow frame t ∀ size:	ype: Alu X	MOOD DP	loor type: Operable se CURT D_ % of Ar	Infiltrat	ON COMH
	· •	•		Watts/SF:_	·	
	1/					
			KW/Unit:_	#Units:		Frac:
	TYPE: NG/	ELEC/CONY	Supply AFUE:	Temp:	GAL/Perso	n-Day:
MECH	ANICAL	•	HEA	TING	COOL	ING
	Primary S. Fuel:	ystem:	HTHW ->		CHK	
	Capacity:		N2G(C 672 K	BTUH	Dag C	<u>(P)</u>
	est.Peak Months ON	Del.Effic:	63,1%		52.1%	
	Hours ON:		_0 _58:08	2	7952	
AHUs	Hp: cfm:		75.10		510	
	Min	OA:	13,400		16% 17000	· · · · · · · · · · · · · · · · · · ·
	Econ	omizer:		<del></del>	Dumb	
MISC	29 hr 51	off Duty	idays-Z	Men		
		ر	· J		· · · · · · · · · · · · · · · · · · ·	
					· · · · · · · · · · · · · · · · · · ·	
			,			
PAGE	1 of 1					

# JOB FT CARSON EEAP UPPATE CALCULATED BY AJN DATE 9/92 Raised & Lowered Selfs on DP-1 in place. 85 gpm Annuban Flow meter TE-12 & TE-13 & could not make Cwping. shut off. CW pump runs confinuosly during. TE-14 Sed at 49°F cooling season. controls V-8 cw Valve. (2-way) on Main Reduin. Auto was not running. I reset the motor control to Start the unit, but the motor produced a loud buzzing noise & did not move the fan. I was unable to check the damper actuation. All linkages are brooked up. Gerand appearance of the MER equipment is very good.

E M C ENGINEERS, INC.

Denver • Atlanta • Germany

P-2700

Mu Hizone Unit 10AP U.S. Fled. Motor 230/460 V;

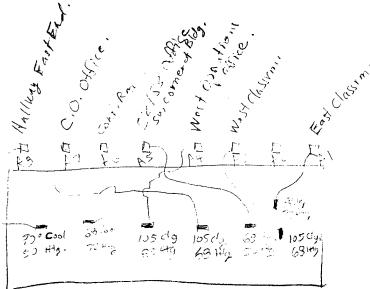
27.4/13,7A

CN Pump

3 MP. U.S. Elect, Motor 200V; 10.0A.

R.A.Fan Century Gald 200-7084 10.4-10,4A.

2- HW pumps (for Pumps CP1 CPIA) 3 HP. U.S. Elect. Motor 200V, 10.0 A



#### *** _ FMEA_SURYEY_OBSERVATIONS__***

	GENERAL_BUILDING_DATA	3/24/45	
,	BLDG #: 2357 BLDG NAME: GYMN SURVEYED BY: TEAM L DATE: 10/25/ CONTACT TELEPHONE NUMBER: TOT BLDG AREA: 26,198 SF # OF	BLDG USAGE FLOORS: 2	JOB #: 124 ACT: : RECREATION # OF FEOPLE:
	BUILDING OCCUPANCY: MON - FRI: DE SATURDAY: CU SUNDAY: HOLIDAYS:	фото 22фо — 1 фото 22фо — 14 фото 22фо — 14	HET CHIFT (DD) COND SHIFT ZOO HERD SHIFT L. L. L. L. L. L. L. L. L. L. L. L. L.
	ENVIRONMENTAL CONDITIONS:  HEATING SETTING WEEKDAYS WEEKDAYS WEEKDAYS DAY NIGHT DAY	<u>POINTS</u> EEKENDS WE NIGHT DAY	<u>COOLING SETPOINTS</u> EKDAYS WEEKENDS NIGHT DAY NIGHT
	PRESENT T'STAT: REQUIRED T'STAT: THERMOSTAT LOCATION(S): SEE SCH HUMIDIFICATION REQUIREMENTS (RH):	ED NEXT SHE	ET (3 of 12)
ZONE ZONE	LIGHTING:  AREA(SF) LAMP TYPE  1) 15,283 FL/MV  2) 12,828 FL/MV  3)  4)  DATA SOURCE: DESERVATION ASHRA SEE ATTACHED SCHEDULE? VN	10501	SCHEDULE ON OLDO OFF 2200 ON OLDO OFF 2200 ON OFF
	ELECTRIC EQUIPMENT:  AREA(SF) TYPE  1)	(KW) W/SF	SCHEDULE ONOFFONOFFONOFFOFFOFFONOFFONOFFONOFFONOFFONOFFONOFFONOFFONOFFOFFONOFFONOFFONOFFONOFFONOFFONOFFONOFFONOFF_
	INTERNAL MASS: MATERIAL: CONC BLE F	AR'N_ ESTIMATE	
	ESTIMATED RATE: M(L, M, H) orAIR CHANGES (CFM/LIN FT CF	or	

#### *** FMEA_SURVEY_DBSERVATIONS__***

GENERAL BUILDING DATA		GROSS
CONSTRUCTION! WALLS: CONSTRUCTION COMPONENT N: EXTLALL 102 S: " E: " W: "	WIDTH "HEIGHT 133-54 21-8" 48-172" 34-0" 132-0 34-0" (3-10" 15-0"	AREA (SF) U-VALUE 2891.6 0,0917 1636.25 4488.0 "
ROOFS: CONSTRUCTION COMPONENT	WIDTH HEIGHT 132.0 89.5"	AREA(SF) U-VALUE JJ.792.6 @.JJ.0
WINDOWS: AREA(SF) TYPE  N: S: 350 4 P  E: W:		DRAPES NO DRAPES DRAPES
FLOOR TYPE: SLAB CRAWL : AREA: , 799.6F		
0550744 45505	: <u>J.</u> TN _2_1N	
ADDITIONAL NOTES:		
FILM #:FRAME #:		
SKETCHES:		

* Specify in "Additional Notes"

Bldg No .: 2357 7015 L

	GENERAL_BUILDING_DATA	
)	CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT	WIDTH HEIGHT AREA(SF) U-VALUE
	S: EXTLALL 102 E: "	85'-4" 34'-0" 2901.33 12.0017 41'-10" 34'-0" 1422.33 " 110-0" 34'-0" 3740.00 "
	ROOFS: CONSTRUCTION COMPONENT ROOF 42	WIDTH HEIGHT AREA (SF) U-VALUE 110'-0 85'-4" 9386.67 0.110
	WINDOWS: AREA(SF) TYPE  N: S: E: W:	SP DP DRAPES SP DP DRAPES SP DP DRAPES SP DP DRAPES SP DP DRAPES
	FLOOR TYPE: SLAB CRAWL S AREA: 0386.67SF PERIMETER: 237-2 LF INSULATION	
	SPECIAL AREAS:	
)	ADDITIONAL NOTES:THERMO	STAT SCHEDULE
	ZONE L	70NEZ
	LLL-SET-55° READS-?	SAUNA COOLOFF SET-80° READS-70°
	U.E. 11 67 11 72	WEIGHT ROOM " 68" 18
	5.kl. 11 82° 10°	LOBBY " 78° " 73°
	SE. 11 57° " 70°	
	FILM #:FRAME #:	
	SKETCHES: ZONE 1 CEILING TEMP = 78	3 <b>°</b>

^{*} Specify in "Additional Notes"

GENER	AL	_BUILD	IN	5_DATA						
		IG SCHE								Pageof
AREA:	7	A) MAIN A)132 + 85	  -0	1.800 2 × 40	<u>'-</u>	SF		7. (1	0/1 3) M 3) _	62 1622 9387 sf 1854 × 63-10
DATA	SC	URCE: _		DRAWING	- , 55	_ <u>1/5</u>	ÚR'	VEY :	ΓΟυ	JR
Mark	:	#lamps	;	W/Fix	;	#Fix	4	Flr	#	: Comments
F.	1			51		27		A		Locker Rms
I_	:		:	50	:	15		A		
_£_	:	2	:	102	1	200		A		WEIGHT/EXCERCISE RM
F.	!	2	:	102	!	4	!	N		RACQUETBALL COURTS
MV	!			400	:	0	:	A		(1
MV	:		-1	400	:	3_	!	A		SQUASH/HANDBALL COURT
* . F	:	2	ł	100Z	1	7	:	A		HALLWAYS
£	<u> </u>		<del>-</del>	51		1		A		1 (1
_F_	;	2	: 	102	!	_3_	; 	A		LOBBY
F	:	1	:	<u>51</u>	:			A		1 11
E.	1	2	:	102	:	_3_	:	A		OFFICE
F	:		:	51	<u> </u>	6	1	A		LAUNDRY/JANITOR
MY	!			4000×	· :	21	:	B.		BASKETBALL GYM
<b>=</b>	:	2	1	102	;	32	:	В		1
	1									
(A) T(	ot <i>e</i>	AL:	32	83		Wat	ts	/	ع,	900sf= <u>1.295</u> _ w/sf
										37SF=_J.367_ W/SF
										THESE LIGHTS HAVE BEEN
Don	٦N	-GRAI	E	D TO	L	DWE	R	WAT	TA	GE LAMPS. FOR PURPOSES
OF.	TH	115 50	IR	VEY, I	T	15 A	SS	MU	ED	THEY ARE 100 WATT UNITS.

Bldg No.: <u>23</u>57

Page 4 of 12

GENERAL BOILDING FOID
MISCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER % MODEL  FUEL SOURCE NAT GAS ELEC OIL STM GEN OTHER*  SUPPLY TEMPERATURE 140 'F, DISTANCE FROM HEATER Ø FT  INPUT RECOVERY RATE OPERATING SCHEDULE
EXTERIOR LIGHTING:  TYPE INC NO SCHEDULE CONTROL  TYPE NO SCHEDULE CONTROL  TOTAL KW SECURITY FARKING LOT ENTRY  OTHER*
ADDITIONAL COMMENTS: DHW GENERATED BY HTHKI FROM LENTRAL PLANT. 3 gpm, Est. 16 hp.
FILM #: FRAME #:
ADDITIONAL SKETCHES:

* Specify in "Additional Comments"

Bldg No.: 2357 7018 1/2

MECHANICAL_EQUIPME	NT_DATA			
AIR HANDLING UNITE  MANUFACTURER  AHU NUMBER:  LOCATION: _MEX	DEANE	MODEL NO ILZONE ACE SERVED: ZON		
RETURN FAN HE: _	SUPPLY CFM: 819 RETURN CFM: EXHAUST CFM: MNT MOM SWITC	CTATIC PEESS.		
COOLING: CW	STM / DIRECT FIRED DX _ FROM CHILLER ILS _ TYPE _ H SPRAY _ ELC _ H	STATE A DE COTI S	TYPE	
R.A. DAMPER: Y E.A. DAMPER: N ECONOMIZER: **	(Y, N), IF YES, F (Y, N), IF YES, F (Y, N), IF YES, O N), IF NO, CA actistor Type F4 (OP) GOOD FAIR	IXED = %, MODULATI A = RA = ENTHALF	ING = % TO %	
SYSTEM OPERATION: *PRESENT OPERAT *REQUIRED OPERA	TION: TO	TO	SUN TO	
	HEATING SETEDINI WEEKDAYS WEEK DAY NIGHT DAY	S <u>COOLING</u> ENDS <b>W</b> EEKDAYS NIGHT DAY NIGHT	**************************************	
SYSTEM SETPOINTS TIME CLOCK: J Smart Economizer S CONTROLS: FNEU	REQUIREMENTS (RH):  (Fixed)  MIXED AIR 58 'F, HO  (Y, N), IF YES, ION  MATIC, ELECTR  TON: EXCELLENT(E), G	OT DECK	D DECK 'F (Y, N) IC/ELEC	
H'STAT COM VALVES ACT	PR _ DAMPERS G_L UATORS P_ BELTS G_	INKAGES (A FANS ( MIXING BOX (A	4- SHEAVES -4-	
COMMENTS: SE	AM SUPPLY VALVE	E & STEAM TRA	P LEAK THRLL	
EVEN @ SHU	TOOLIN. OA ZRA	DAMPERS 10 L	lot change	/_
POSITION WHITE	HEN UNIT IS TURN of the item is the sa	ED OFF SEE M: me as the GENERAL		
Bldg No.: 2357		•	Page 6 of 12	<b>"</b>

# MECHANICAL_EQUIPMENT_DATA

Bldg No.: 2357

MANUFACTURER TRAVE  MODEL NO. REHEAT SYSTEM  AHU NUMBER: Z AHU TYFE: DRAW THRU REHEAT SYSTEM  LOCATION: MEZZ MER  COWTS
SUPPLY FAN HP: 7.5 SUPPLY CFM: 14,235 STATIC PRESS: 15 RETURN FAN HP: RETURN CFM: STATIC PRESS: EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS: DISCON DISCON
COILS: 3/4" (JEANNY)  DIRECT FIRED NO GILL FIC DIHER
NO COOLING: CW DX . FROM CHILLER . FROM DX UNIT  REHEAT: # OF COILS 4 TYPE SIM. RECOOL: # OF COILS _ TYPE  NO HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY 3 WAY _  4 act: on stm coil vivs (1/2") Type J; one broken; others are UN" (unable to move actuators)
DAMPER: Y (Y, N), IF YES, FIXED = %, MODULATING 0% TO 100%.  R.A. DAMPER: Y (Y, N), IF YES, FIXED = %, MODULATING 10% TO 100%.  E.A. DAMPER: H (Y, N), IF YES, FIXED = %, MODULATING = % TO = %  ECONOMIZER: N (Y, N), IF YES, OA = RA = ENTHALFY = 15 NO. CAN ECONOMIZER BE ADDED YES?  FACE (Bypes damper = Act Type = F1 (OP); O. A lampa = Act. Type F5  FILTER CONDITION: GOOD FAIR FOOR 58" AP THROW-AWAY
SYSTEM OPERATION: MON - FRI SAT SUN  *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMF:  *REQUIRED TMP:  HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: N (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: FNEUMATIC ELECTRIC PNEUMATIC/ELEC  2"577 VLV (Z-WAY) (OP) Act = Type F5  EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) T'STAT P  H'STAT - COMPR - DAMPERS G LINKAGES G FANS G SHEAVES G  VALVES P ACTUATORS P BELTS G MIXING BOX G  OTHER
COMMENTS: STEAM VALVES & TRAPS LEAK THRU EVEL @ SHUT DOWN.
SEE SHI M-7 FOR OPERATING STRATEGY (or Sheet 11412)

Fage _7_of 12

MECHANICAL EQUIPMENT DATA	~~
AIR HANDLING UNITS:  MANUFACTURER TRANE CLIMATE CHOR MODEL NO. 17/5N 116B-044398  AHU NUMBER: 3-boll AHU TYPE: DRAW THRU  LOCATION: GYM CAIWALK SPACE SERVED: FONE 2	(
FAN DATA:  SUPPLY FAN HP: 5 SUPPLY CFM: 1.360 STATIC PRESS: 0.25  RETURN FAN HP: - RETURN CFM: - STATIC PRESS: -  EXHAUST FAN HP: - EXHAUST CFM: - STATIC PRESS: -  MOTOR STARTER: MNT _ MOM SWITCH: P.B H.O.A. DISCON	
HEATING: HW STM / DIRECT FIRED> NG OIL ELC OTHER NO COOLING: CW DX FROM CHILLER, FROM DX UNIT NO REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE NO HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY, 3 WAY	
DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING D% TO LOW.  R.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING D% TO LOW.  E.A. DAMPER: N (Y, N), IF YES, FIXED%, MODULATING% TO%.  ECONOMIZER: N (Y, N), IF YES, OA RA ENTHALPY  OA LEAKAGE: N (Y, N), IF YES, OA RA ENTHALPY  THE BYPAN Dayer Act = Type F4 (N); O As Dayer Act Type F6  FILTER CONDITION: GOOD FAIR FOOR T.A.	
SYSTEM OPERATION: MON - FRI SAT SUN  *FRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO	
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:	
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: N (Y, N), IF YES, IS IT OPERATIONAL (Y, N)	
CONTROLS: PNEUMATIC ELECTRIC PNEUMATIC/ELEC STM VLV Z-WAY 1/2" Type J (N) D.A. CHARTON STM VV Closes whe O.A. IL WE GO F EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F) T'STAT H'STAT COMPR _ DAMPERS G LINKAGES G FANS G SHEAVES G VALVES P ACTUATORS P BELTS G MIXING BOX G OTHER_	
COMMENTS: ALL STEAM VALVES & TRAPS LEAK EVEN & SHUT-DOLLY.	
SEE SHT M-7 FOR OPERATING STRATEGIES.	
Summer/winter/ night witch present; (OP)	,

Bldg No.: 2357_

DECHANICAC EDUIFMENT DATA
AIR HANDLING UNITS:  MANUFACTURER TRANE  AHU NUMBER: 7 AHU TYFE: (ABINETAIR CONDITIONER LOCATION: RM LOZ CELLING SPACE SERVED: RM LOZ (OFFICE) ZONE
FAN DATA:  SUPPLY FAN HP: 42 SUPPLY CFM: 600 STATIC FRESS: —  RETURN FAN HP: 7 RETURN CFM: 5 STATIC PRESS: —  EXHAUST FAN HP: 7 EXHAUST CFM: 5 STATIC PRESS: —  MOTOR STARTER: MNT MOM . SWITCH: P.B. H.O.A. D DISCON
COILS:  HEATING: HW STM DIRECT FIRED> NG OIL ELC_V OTHER COOLING: CW DX FROM CHILLER (FITRAL, FROM DX UNIT  NO REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE NO HUMIDITY: STM SFRAY ELC HW CW COIL VALVES: 2 WAY 3 WAY
DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING O% TO WOW.  R.A. DAMPER: N (Y, N), IF YES, FIXED -%, MODULATING -% TO -%  E.A. DAMPER: N (Y, N), IF YES, FIXED -%, MODULATING -% TO -%  ECONOMIZER: N (Y, N), IF YES, OA - RA - ENTHALPY -  OA LEAKAGE: 5 % IF NO, CAN ECONOMIZER BE ADDED NO RA-Capal
FILTER CONDITION:GOODFAIRPOOR NONE
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP:  *REQUIRED TMP:  HUMIDIFICATION REQUIREMENTS (RH):  HUMIDIFICATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: NO (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT A
COMMENTS:
> Disregard if the item is the same as the GENERAL BUILDING DATA.
The second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of th

Page 9 of 12

Bldg No.: 2357____

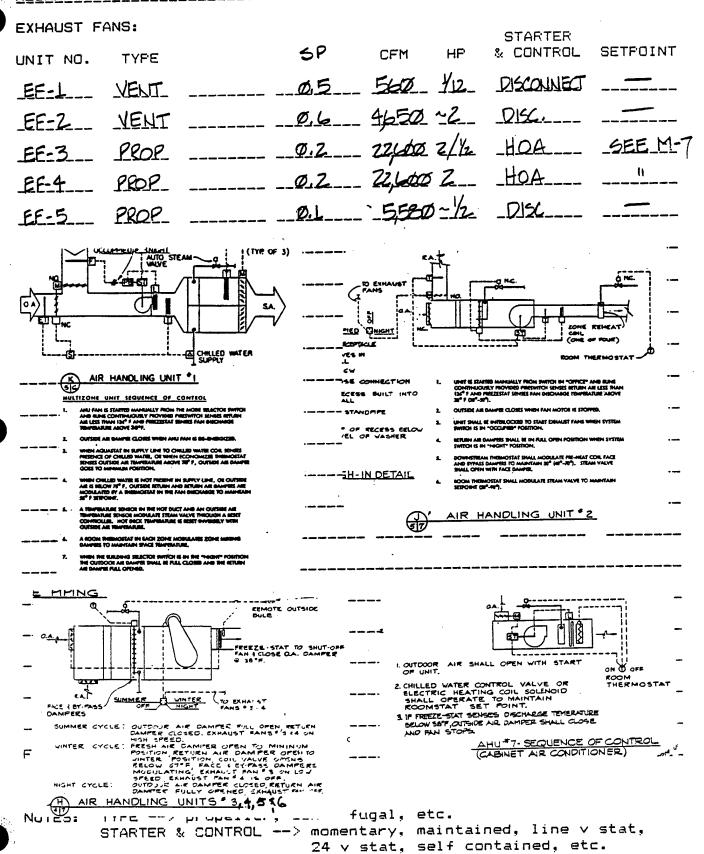
MECHANICAL_EQUIPMENT_DATA
HEATING PLANT
PLANT DESCRIPTION: NUMBER OF UNITS: MAKE & MODEL: 1) 2)
EQUIPMENT: BOILER DIRECT FIRED STEAM CONV  TYPE: STEAMHWCAST IRONWATER TUBE, FIRE TUBE  FUEL: NAT GAS ELECTRIC OIL OTHER
MULTIPLE UNIT OPERATION SEQUENCE: SERIES FARALLEL
BURNER STAGES: SUPPLIED BY HTHIN FROM CENTRAL PLANT
NO FIRING RATE/FUEL: #1: #2:
NO BURNER TYPE:POWER: MFR MOD NoCFM  BLOWER/_/AHF @CFM  CONTRL/_/A  MOD No
HOT WATER: SUPPLY SIZE TEMPERATURE PRESSUREPSI RETURN SIZE TEMPERATURE PRESSUREPSI PSI PRESSUREPSI PSI PSI PSI PSI PSI PSI PSI PSI PSI
RATED CAPACITY: MAX BTUH IN MAX BTUH OUT 2582,250
CONTROLS: TYPE ELECTRIC BARBER COLMAN CONDITION GOOD
PLANT AUXILIARIES:  FUMPS: HH 1) A
FANS: 1)AHP @CFM   2)/AHP @CFM   3)/_AHP @CFM
OTHER 1) 208/3/60-3569 34 HP (CHW)
AUX OPERATING SCHEDULES:  FUMPS: HW 1)ONOFF 2)ONOFF  COND 1)ON_IMMOFF 25MIN 2)ON_LMIN OFF 25 (ALTERNATE)  FANS: 1)ON_OFF 2)ONOFF 3)ONOFF  OTHER: 1)ON_OQ_OFF 24 2)ONOFF CHMMER ONLY)
AUXILIARY FUEL USED: #2 OIL NAT GAS OTHER

Bldg No.: 2357____

Page 10of 12

#### MECHANICAL EQUIPMENT DATA

Bldg No.: 2357



Page 11 of 12

MECHANIC	CAL_EQUIPM	ENT_DATA					
UNITARY	HEATING E	OUTPUT	HEATING			STARTER	•
UNIT NO.		CAFACITY	SOURCE	CFM	HP	& CONTROL	SETPOINT
114#1_	UNIT	19,400	5B151M	300	412	I-STAI	_58°F
							. — — — — — — — — — — — — — — — — — — —
				<u>-</u>			
FILM #:	F	FRAME #: _					
						ct furnace,	
		wall furn	ace, etc. electric,	gas fi			
	STARTER 8	control .		ary, ma		ed, line v	

Bldg No.: 2357____

. Page 12 of 12

**** FMEA SIM	ILAR BUILDINGS SURVEY	
NERAL BUILDING DATA		9/92 ) AJN/JOE)
LDG #: 1856(P)BLDG NAME: URVEYED BY: AM BLDG LDG USE: CYM # F	CONTACT:	: 2-13 85 JOB #: 124 TELEPHONE EXT: BLDG AREA: 23159 SF
	NTH E S 0630 TO SUN 1000	2000 SUMMER 2200 WINTER 1800
STAT SETTING: HTG: 75	AUTO SETB	ACK: (N) / Y:/
emperature, Future, insidemperature, Future, inside	le,0ccupied:65/98	Temp Present: 72 AirChange/hR: 39
RCHITECTURAL		
WALL	AREA U-val	ue UA 2,823
GLASS	500 1.176	588
ROOF	21126 -119	2514
FLOOR	.60	525
SUM	31,771	6,450
ndow size: x Entry doors: 8 # 0 IGHTING: Type:Fluorescen-	TH Doors: 8 of	<del></del>
LECTRICAL EQUIP:	KW/Unit:#Unit	s: Util Frac:
HW: TYPE: NG/ELEC CONY	Supply Temp: <u>~157</u> AFUE: <u>63.1</u> %	GAL/Person-Day:
ECHANICAL	HEATING	COOLING
Primary System:	HTHW -> STM Conv.	CHW
Fuel:	NeG (CP)	Nacs(CP)
Capacity:	258725 KBTUH	
est.Peak Del.Effic:		51.12%
Months ON: Hours ON:	8	4
HUS Hp:	<u> </u>	<u> </u>
cfm:	32.5 67,575	8140
Min OA:	20%	20°6
Economizer:		Dumo
ISC:		
• <u>F4ZONE</u> AHU 5-	SINGLE ZONE UNITS	
· 1-CONVERTOR - 212 M	BH OUT	
· I-STEAM GENERATO	R. 2120 MBH OUT	
		<u> </u>

PAGE 1 of 1

# Denver • Colorado Springs • Atlanta • Germany P - 1856 JOB FT CARSEN EEAP UPPATE SHEET NO. OF OF OALCULATED BY AJN DATE 9/92 CHECKED BY DATE SCALE

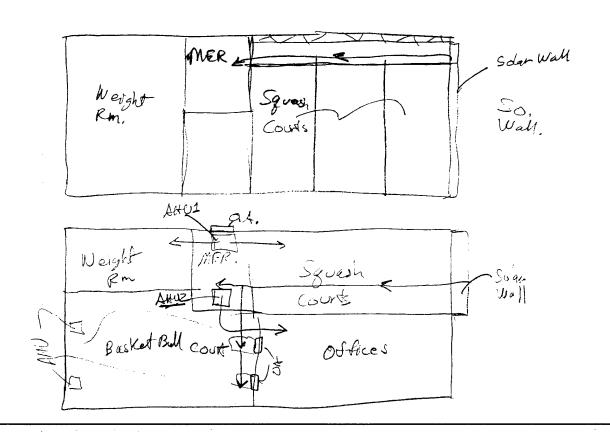
AHUI (somes weight Rm & Squash Courts) Htg Dwy 7,5 HP

T-STATS operate F & Bypass damper.

O.A. Act. Type B; STM 2-WAY VLV. 1/4" Act. = Type J

R.A. Act. Type B Spons & closes on O.A. Sensor setpt. of 66°F

AHUZ (Hallways / Offices/ Rost izms) Same TSTATS operate F& Bypus dangers. O.A. Act. = MA-415 (B/C) SIM Z-WAY Same; Set at 53°



GENERAL BUILDING DATA - Z  LDG #: 2359 BLDG NAM  SURVEYED BY: TEAM L DAT  CONTACT TELEPHONE NUMBER	E: TVY CHA	BLDG	CONTACT:	JOB #:	41.15.04.1
CONTACT TELEPHONE NUMBER TOT BLDG AREA: 6547	SF # OF F	LOORS:	# OF	PEOPLE: _	
SAT	- FRI: <u>0730</u> URDAY: 1630 DAY: <del>2600</del>	TO 1730 TO 1907 TO 1907	) <del>SEEND-</del>	SHIFT) (A)	2_
TUES FRI HEL	<del>idays:</del> 19ac	DTO 2200	HOLIDA	¥5.→ 8	2
ENVIRONMENTAL CONDITIONS			' '		
MEER D H	EATING SETPO AYS WEE	INTS VENDO	<u>Q</u> WEEKDA	COLING SEI	EKENDS
ZONE L/ZONEZ DAY N PRESENT T'STAT: 10/60 70 REGUIRED T'STAT: THERMOSTAT LOCATION(S)	IGHT DAY 2/62	NIGHT	DAY NI 15/76 - 10/78 -	GHT DAY	NIGHT
HUMIDIFICATION REQUIRE	MENTS (RH):	· H'(	STAT LOCA	TION(S): _	
2) 5217 FU/TN			.28 ON ON ON ON	SCHEDULE OFF OFF OFF OFF	
DATA SOURCE:OBSERVATION SEE ATTACHED SCHEDULE?	DNASHRAE YN	OTHE	₹		
ELECTRIC EQUIPMENT:  AREA(SF) TYPE		(KW) W.		SCHEDULE	
2)			ON_	OFF OFF OFF	
4) DATA SOURCE:OBSERVATION SEE ATTACHED SCHEDULE?	ONASHRAE	OTHE	ON	GFF_	
INTERNAL MASS: MATERIAL:	Boxs, Fire	UTUREST:	MATED MA	ss: L (L,	м. н)
INFILTRATION: LOCATION (S. THEREFORE, NO INFILTRA	: THE BULL	DING 15	SLIGHTLY	Persurit	ED
	, M, H) or R CHANGES or M/LIN FT CRA(	ok:			

<u> </u>				•
CONSTRUCTION:  WALLS: CONSTRUCTION COMPONENT.  NE N: BRICK/CMU  SW E: BRICK/CMU  NW N: BRICK/CMU			AREA (SF) 	0.129
ROOFS: CONSTRUCTION COMPONENT BUR/INS/MTL DECK	WIDTH		AREA (SF) 4035.4	
WINDOWS: AREA (SF) TYPE U-FACTO  NE 11: 261.4 0.68  SE 5: 192.0 0.568  SW E: 253.3 0.847  NW #: 132.0 0.568	SP SP SP SP	X DP X	DRAPES	-
FLOOR TYPE: X SLAB CRAWL AREA: 3460 SF  PERIMETER: 203.0 LF INSULATION  SPECIAL AREAS:	? <u>/</u> Y_	_N Z IN	to 24" I	
ADDITIONAL NOTES:				·
FILM #:FRAME #:				, samp min-
SKETCHES:				

^{*} Specify in "Additional Notes"

GENERAL_BU	ILDING_DATA				
NE H:	BRICE/CMU	WIDTH	HEIGHT	AREA (SF) 796.0 1713.4 884.0 1123.6	U-VALUE Ø.129 Ø.129 Ø.129 Ø.129
ROOFS:	CONSTRUCTION COMPONENT  MIL/INS/CONC/BUR	WIDTH	HEIGHT	AREA (SF) 5122.6	U-VALUE <b>Q.Q</b> 90
NE 4: WINDOWS:		SP SP SP SP	DF X DF _ DF _ DP	DRAPES DRAPES DRAPES DRAPES	  
AF	PE: X SLAB CRAWL REA: 521] SF TER: 217 LF INSULATION				
SPECIAL AF					
FILM #:	FRAME #:				
SKETCHES:					

* Specify in "Additional Notes"

GENERAL BUILDING DATA	٠.
MISCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER & MODEL RHEEN 4500 W 30 GA  FUEL SOURCE NAT GAS _X ELEC OIL STM  SUPPLY TEMPERATURE 152 F, DISTANCE FROM HEATER  INPUT 4500 WRECOVERY RATE OPERATING SCHE	GENOTHER*
TYPE TNC NO T SCHEDULE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINUE CONTINU	
ADDITIONAL COMMENTS:	
FILM #: FRAME #:	
ADDITIONAL SKETCHES:	

* Specify in "Additional Comments"

Bldg No.: 2369

) .888	) IGHT:	ING SCH	HEDULE					Page	of
~ "	AREA:	(A) MA: (A)	INX_	S	F :	(B) MEZZ	xs	SF	
	DATA :	SOURCE:	DRAW	INGS	_SURVEY	TOUR			
	Mark	: #lamp	os ! W/F	ix / #F	ix ¦ F1	r # :	Commen	ts	
	F	2	LØZ	2 2		< 1CH0	IR/STORAGE		ZONEI
	_F	- 2	1000	5 - 2	'_A	- CHAH	2 <u>EL</u>		EOVIET
J	_ <u></u>	<u>'</u>	15	<u>z   L</u>	2 1 A	- HAL	LLIAY		20世土
	F	2	<u> 107</u>	2 1 2	<u>' A</u>	'Nu	rsery (RMII	8)	20151
	<u> </u>	<u> </u>	: 200	) ! ]	<u> </u>		(1		11
	F	12	100	: 2	<u>'_</u> A		LET		70 NE 1
	<u>I</u>	<u>. لــــــــــــــــــــــــــــــــــــ</u>	150	<u> </u>	3	· JAR	THEX (LOBBY	)	FONE I
							WIY		
	<u>F.</u>	1 2	: 100	: 2	_ <u> </u>	ME	N'S TOILET	<i>.</i>	ZONE 1
٠.	_F	2	100	: 2	-	'WM	IN'S TOLLET		ZONE I
	F	1 2	100	: 4	·	!RM	113		70HZ1
	_£	1 2	: TQQ	- ' 6	, <u>  A</u>	!RM	4,416,11	73	EONE I
							للرطلك بالما		Zone I
		:	1	;	;	:	,		
		83							
	(A) TO	TAL: _	7900	),Ø	atts/	3A60	SF=	Z.28 W	/SF
	(B) TO	TAL: _	<b></b>	W	atts/	· — — — — — — — — — — — — — — — — — — —	SF=	W	/SF
	ADDIT	TONOI I	NOTEC.						

BIdg No.: 2359 70NE L

GENERAL_BUILDING_DATA

# GENERAL BUILDING DATA

LIGHTI	NG SCHEI	DULE					Page	of	
AREA:	(A) MAIN	x	SF	(B)	MEZZX_	SF			
		DRAWINGS							
Mark	#lamps	W/Fix	#Fix	; Flr ‡	‡	Comments			
F	2	<u> </u> 7000	3	' A	' KITCHEN	1/ PANTRY	1	20NE_2_	
F!	2	Loo	4	<u> </u>	! REC RO	om-Rec.		DNE Z	
		•			' STORAG				
I.	<u>_</u>	60	12	' A	! REL ROC	24-REC.	- 7	0H=Z	
F	<u></u> 上	150	15	' A	' CANCILL	ŁRY	<u></u>	D152	
				-	i h				
7		300	5	; A	i ,			N	
<del></del>	<u>-</u>	100	6	· A	L L				
					·				(
					i k				
					!				
		!							
	- <del></del>	<u> </u>	 !	:	†				
	 	!	 !		;				
	65		 !						
(A) TO	TAL:	7410.0	<u>X</u> Wat	ts/	5217	SF=	42	W/SF	
		TES:							

# *** FMEA_SURVEY_OBSERVATIONS__***

'ECHANICAL_EQUIPMENT_DATA
AIR HANDLING UNITS:  MANUFACTURER TRANE  AHU NUMBER:  LOCATION:  MER  MODEL NO. CLIMATE CHGR  MODEL NO. CLIMATE CHGR  MODEL NO. CLIMATE CHGR  MODEL NO. CLIMATE CHGR  AHU TYPE: VERTICAL DRAW-THRU  SPACE SERVED: 7015
FAN DATA:  SUPPLY FAN HP: 3 SUPPLY CFM: 3445 STATIC PRESS: 14  RETURN FAN HP: - RETURN CFM: - STATIC PRESS: -  EXHAUST FAN HP: - EXHAUST CFM: - STATIC PRESS: -  MOTOR STARTER: MNT _ MOM SWITCH: F.B H.O.A DISCON _
COILS:  HEATING: HW STM DIRECT FIRED> NG OIL ELC OTHER COOLING: CW DX FROM CHILLER CENTRAL FROM DX UNIT  LOREHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE  LOHUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY, 3 WAY
DAMPERS:  O.A. DAMPER: (Y) N), IF YES, FIXED%, MODULATING 75% TO 100%  R.A. DAMPER: (Y) N), IF YES, FIXED%, MODULATING 0% TO 100%  E.A. DAMPER: (Y) N), IF YES, FIXED%, MODULATING 0% TO 100%  ECONOMIZER: (Y, N), IF YES, OA RA ENTHALPY  OA LEAKAGE:
ILTER CONDITION: GOOD FAIR FOOR TA duet work & damper are installed.
SYSTEM OPERATION: MON - FRI SAT SUN  *PRESENT OPERATION: COLT TO
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP: *REQUIRED TMP:
HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELEÇTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F) T'STAT G H'STAT COMPR DAMPERS P LINKAGES P FANS G SHEAVES G VALVES P ACTUATORS G BELTS G MIXING BOX G OTHER
COMMENTS: Barbon Colman. Elect. Controls, Act. Type Jon MTHW To Call (3-way 1" Value)
O.A. Danger 15 Type G - minimum O.A. only.

Bldg No .: 2359 ZONEL

Page 7_of_13

MECHANICAL_EQUIPMENT_DATA
MANUFACTURER TRANE  MODEL NO. CLIMATE CHGR  AHU NUMBER: L AHU TYPE: VERTICAL DRAW-THRU  LOCATION: MER SPACE SERVED: SANCTUARY (NAVE)
FAN DATA:  SUPPLY FAN HP: 3 SUPPLY CFM: (255 STATIC PRESS: 2"  RETURN FAN HP: 1 RETURN CFM: 4730 STATIC PRESS: 3/8"  EXHAUST FAN HP: 2 EXHAUST CFM: 3 STATIC PRESS: 4 DISCON
COILS:  HEATING: HW STM _ DIRECT FIRED> NG _ OIL _ ELC _ OTHER _  COOLING: CW DX FROM CHILLER CENTRAL, FROM DX UNIT  PREHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE  NOHUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY _ , 3 WAY
DAMPERS:  O.A. DAMPER:
FILTER CONDITION:GOODFAIRFOOR TA
#PRESENT OPERATION: MON - FRI SAT SUN  *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP: 60 10 60
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: FNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
H'STAT — COMPR — DAMFERS P LINKAGES P FANS G SHEAVES G OTHER
COMMENTS: LINIT WAS NOT OPERATING @ TIME OF CURVEY—
ALL ATTEMPTS TO RUN UNIT FOR TEST PURPOSES WERE
UNGUCCESSFUL 1"3 way Coil Value Act. Type B

Bldg No .: 2359 FONE Z

Page <u>8 of 13</u>



MECHAN	TCAL	EQUIPMENT	ΠΔΤΔ
HELDHIN	ILML	EGOTELENI	

AIR HANDLING UNITS:  MANUFACTURER TRANE  AHU NUMBER: 3 AHU TYPE: HORIZONTAL DRAKITHRU  LOCATION: WER KITCHEN CLG SPACE SERVED: ZONE Z
FAN DATA:  SUPPLY FAN HP: ~2 SUPPLY CFM: 2320 STATIC PRESS: 1.5  RETURN FAN HP: — RETURN CFM: — STATIC PRESS: —  EXHAUST FAN HP: — EXHAUST CFM: — STATIC PRESS: —  MOTOR STARTER: MNT _ MOM SWITCH: P.B H.O.A DISCON
COILS:  HEATING: HW STM DIRECT FIRED> NG OIL ELC OTHER COOLING: CW DX FROM CHILLER CENTRAL, FROM DX UNIT  NO REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE  NO HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY, 3 WAY
DAMPERS:  O.A. DAMPER:
FILTER CONDITION:GOODFAIRPOOR ? TA
SYSTEM OPERATION: MON - FRI SAT SUN  *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP:  *REQUIRED TMP:  HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT G  H'STAT COMPR DAMPERS LINKAGES FANS SHEAVES  VALVES ACTUATORS BELTS MIXING BOX  OTHER
COMMENTS: UNIT INACCESSIBLE DUE TO LACK OF PROPER EQUIPMENT
AND QUANTITY OF GOODS IN PANTRY - MOTOR HP IS CALCID -
3-way 1" coil Value - Type J networks

Bldg No.: 2359 FONE 2

Page 9_of_13

# MECHANICAL_EQUIPMENT_DATA

ŀ	4F	Δ	Т	T	N	l	6	P	•	Δ	N	ıΤ	•

PLANT DESCRIPTION	ON:		*
NUMBER OF UNI	TS:	ily WHanks	with my Tran A 1 4
MAKE & MODEL:	1) SHELLETING	72 2 44 14 14 14 14 14 14 14 14 14 14 14 14	W/Tran & actions
	3)	-12 Z >- May V.C.	introl VIV w/ Type A actuation.
EQUIPMENT:	BOILER DIRECT M MTHWCAST IRO	FIREDSTEAM	CONV
TYPE: STEA	M MICHWCAST IRO	NWATER TUBE,	FIRE TUBE
FUEL: NAT GAS	ELECTRIC	UIL UIH	EF HTHW/CENTRAL
	PERATION SEQUENCE:	PARALLEL —	
BURNER STAGES	:		
FIRING RATE/F	UEL:#1: <u></u>	#2:_	
BURNER TYPE:	FOWER:MFRBLOWER	MO	D NoEFM
	CONTRL	//A MO	D No
MTHOT WATER:	SUPPLY SIZE Z	_ TEMPERATURE _Z	PRESSURE 60 PSI
STEAM:	HEADER SIZE	TEMPERATURE	PRESSURE PSI
RATED CAPACIT	Y: MAX BTUH IN MAX BTUH OUT	380 KBTU / hr. :	
CONTROLS: TYPI	E B-C PUEUMA	TC ELECTRIC	
PLANT AUXILIARI	ES:		
PUMPS: HW	11200/3/60-	A 3/4 HP	
COND	2)/	_AHP	•
COND	1)/_/	_AHP	
FANS:	1)/	'	BCFM
•	2)/_/	_AHP HP	BCFM B CFM .
•	· · · · · · · · · · · · · · · · · · ·		-tab date table mad many made date date
OTHER	1)208/3/60	_AHP	AIR COMP
AUX OPERATING S	CHEDULES:		
FUMFS: HW	1)ONOFF		<del></del>
COND		2) ONOFF	
FANS: OTHER:		2) ONOFF 2) ONOFF	_ 3)
tad it it it is a	* : WITUI (		
AUXILIARY FUE	L USED: #2 OIL	NAT GAS	OTHER

Bldg No.: 2359

Page 10_of_13

	· .			,					
	MECHANICA	<u>EQUIPM</u>	ENT_DATA						
	UNITARY H	EATING E	QUIPMENT:	HEATING		٠	STARTER		
	UNIT NO.	TYPE	CAPACITY		CFM	HP	& CONTROL	SETPOINT	
	<u> </u>	FC	44800	H WIHK		w/6	SCT-STAT		
	FGL	<u>FC</u>	LEMBU	-MIHKL	200	<u> </u>	WALLSTAT	NOT USED	)
	Fr Z	FC.	73 MBH	MIHW_	300	2/10	WALL STAT	70° (30	IJſ
		FC	30MPH	. (1	400			<u>" (1</u> 4	
	·		44 MBH	11	600	A.	SLTSAT	70° (3U	Ыľ
		FC.			300		-	70° (1UN	`
	FLb	FC		((		,		η ((	•
			211-241-		ــــــــــــــــــــــــــــــــــــــ	+=_			
					نه که خه هه چه چه			1400 cm 400 cm 400 cm did take	
		-cain cain -cain -chitt -chite -chitP -							
							<u></u>		
							* *		
•								100 No. 201 1170 1170 1170 1170 1170 1170 1170	

FILM #: ____ FRAME #: _

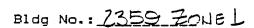
NOTES: TYPE --> unit heater, unit ventilator, duct furnace,

wall furnace, etc.

HEATING SOURCE --> electric, gas fired, oil, steam,

hot water, etc.

STARTER & CONTROL --> momentary, maintained, line v stat, 24 v stat, self contained, etc.



MECHANICA	<u>L_EQUIPM</u>	ENT_DATA					, <del></del>
UNITARY C	OOLING E		OOLING			STARTER	
UNIT NO.	TYPE	CAPACITY S		CFM	HP	% CONTROL	SETPOINT
FC-L -		T_USED_					
FC-2_	FC	GOOD BILLY	CHW	300	1/6_	WALLSTAT	78° (3UNIT
FC-3_	"	BLOOPFUH	<u> </u>	400			11 11
FC-4	<u>h</u>	IL,700BIUH_	, 	600		SCIESTAT	
		62000 PTUH		300		WALLSTAT	
FC-6	11	16,000 BTUH	H	300	~/4		11
	TEMP	ERATURE CONTROLS		opi oci	n to the coil. O	In a fall in space temperat	
	F OPERATION	EM CHANGEOVER CONTROL	SECHIENCE:	far	and close 0-1,	eeze Stat: T-4 shall stop to D-2, and D-3 should tem	the supply fan and R. A. peratures rise above or
A remot	e buib thermostatem to heating cyc	t sensing outside air tempe tie at 70F and below, and to	rature shall switch cooling cycle at 75	1 F 5. <u>A.</u> F	. U. #Z CONTRO	pective settings. <u>L SEQUENCE:</u> Jergized electric pneumati	ie raisu E9-1 chail ha
and abort chilled to heating	water on cooling a	wer three-way valve to com and closing straight-thru o	chilled water valve	on en	ergized and outd energized D-1 s	oor air damper D-1 shall	open. When the lan is
2. CHILLED	•	AND RETURN TEMPERATUR	E AND PRESSURE	· WI	nter Cycle	er switch S-1 in the wint	er position room thermostat cated in the discharge air.
A senso	r in return line i	from heating and cooling u seen at 58F to closed at 42F.	. A pressure differ	T-2	in conjunction	with T-1 shall, on a fall	In space temperature, On a rise in space temper
oressur	es shall override	chilled water supply and c the temperature controller Valve shall close when s	r to maintain differ	Su	re, the reverse mmer Cycle:		of T-2 is reversed through
cycle.	CHANGER CONTR		,	rel T-	ay R-2. T-2 is o I shall, on a rise	reversed through relay R- e in space temperature, m	2. T-2 in conjunction with odulate V-1 open to the
In resp	onse to an outdoo	r thermostat a water tempe ter temperature by modula	ting the high temp	er- sta	t T-3 and firesta	t T-4 shall stop the unit f	erse shall occur. Freeze- an and close the outdoor rises above their respective
cycle.		. Valve shall close when s	system is on coolin	set	ting. I.U. #3 CONTROL	·	11363 apple friett Leabertine
Winter	#1 CONTROL SEQUENCY Cycle: The unit is commer to be and	<u>UENCE:</u> lan and R. A. fan shall run exhaust air damper D-3 sh	continuously. Ou	ut Wi	nter Cycle: The shall initially	unit fan shall run contie	nuously. Outdoor air damper Itlon as determined by switch
minimu — shall cl	m position as det lose a proportiona	ermined by switch S-L Re te amount. Room thermos	eturn air damper D tat T-1 shall reset	-2 S- the	ermostat T-1 sha	Il reset the control point	roportionate amount. Room of submaster 1-2. ulate 3-way valve V-1 loward
tempera	dure first modula	naster thermostat T-2. T-2 ate 3-way valve V-1 toward l erature T-2 shall modulate	by-pass position.	On the sh	by-pass position all occur.	n on a continued rise in	lemperature the reverse
and D-2	? closed. On a failer Cycle. Relay i	If in temperature the rever R-1 shall place V-1 under o	se shall occur. Jirect control of T-	L Re	ay R-2 shall pre	elay R-1 shall place V-1 u event D-1 from opening be i on a rise in space tempe	nder direct control of T-1.  eyond its minimum open
Relay R	-2 shall prevent osition. T-1 shall	D-1 and D-3 from opening on a rise in space tempera	peyong its minimu eture modulate V-1		the coil. On a f	all in space temperature,	the reverse shall occur.
	:					reezestat T-4 shall stop the above or fall below their	e fan and close D-1 should respective settings.
FILM #:		FRAME #:		<u>w</u>	inter Cycle:	NTROL SEQUENCE	
	T\/P:P :-	المقصدة والمساهرين	1i+-	Vā		• • •	perature modulate 3-way I in space temperature, the
(	COOLING	window unit	electric,	ga m	ummer Cycle: R	oom thermostat shall on any valve open to the coil.	rise in space temperature On a fall in temperature, th
	STARTER	& CONTROL	-> moment -> 74 v e	ary re	verse snall occu nit fan shall ene	r. rgize motorised O. A. Dar	nper to open.

Bldg No.: <u>2359</u>

# MECHANICAL EQUIPMENT DATA

EXHAUST F						STARTER	
UNIT NO.	TYPE	AREA	- <b>5</b> P	CFM	HP	& CONTROL	
1 & 2	PROP	101LETS	1/4"	200	-412	WLIGHTS_	مااشینیسی شم خبید نما نما ماه ماه ماه ماه
3:4	<u> </u>	JAN ETIT		_LØØ	-4/12_	W/LIGHTS_	
546	CENT_	ACTIVITY RM	1/4"	315_	-1/6	Waysu.	
· · · · · · · · · · · · · · · · · · ·							
						. ,	
			<u> </u>				
					اد الله می می می می می _د ب		
					خه نده ده ونه و		
FILM #: _		FRAME #:				· ,	

NOTES: TYPE --> propeller, centrifugal, etc.
STARTER & CONTROL --> momentary, maintained, line v stat,
24 v stat, self contained, etc.

# GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

ECO TITLE	ANNEX A		ANNEX B	DATE_	COMENTS
NSULATION	Al		B01		NA
STORM WINDOWS OF DOUBLE GLAZING	A2		_B02		N/A - Door gless is sinute penelly sit
EATHER STRIPPING and CAULKING	A3		B03		N/A building B producted
INSULATED PANELS	A4	#	B04		N/A - Glass ared for day lighting
/ESTIBULES or REVOLVING DOORS	A5	#	B05		WA
.OAD DOCK SEALS (Strip Door or Air Cu)	A6		B06	·	WA
REDUCTION OF GLASS AREA	ΑŹ		B07		WA
EPLACE KITCHEN LIGHT FIXTURES	A8	Ŧ	808		NA
SHUTDOWN DHW or MOD CTRLS (Non FH)	A9		B09		· Roduce Temp to 105°F
REDUCE LIGHTING LEVELS	A10		B11		NA
EPLACE INCANDESCENT LIGHTING	A11	#	B12		N/A
ISE MORE EFFICIENT LIGHTING SOURCE	A12	i	B10	01	· Replace Inc. With Twin Tube A
HIGH EFFICIENCY MOTOR REPLACEMENT	A13		B13		All motors
IIGHT SETBACK/SETUP THERMOSTATS *	A14		B14		. Set back to 65/55 and up to 28
(NFRARED HTRS (Motor Rep Shops & Whse)	A15		B15	1	NA
CONOMIZER CYCLES (Dry Bulb Type)	A16		B16	100	· Intell on 3 units
CONTROL HOT WATER CIRC PUMP *	A17		B17		NA
M RADIO CONTROLS	A18		B18	1	NA
RADIATOR CONTROLS	A19		B19	<del>                                     </del>	NA
DECENTRALIZE DHW HTRS (POU HErs) *	A20		$\overline{B}$	<del>                                     </del>	NA
EAT RECLAIM from HOT REFRIG GAS	A21	1	B20	1	N/A
EDUCE AIR FLOW *	A22		B21	1	NA
PREVENT AIR STRATIFICATION *	A23		B22	<del> </del>	NA
INSTALL TIME CLOCKS	A24	<del>                                     </del>	B23	<del> </del> -	N/A
HILLER REPLACEMENT	A25		B	<del> </del>	NA
EPLACE ABSORPTION CHILLER	A26	<del>                                     </del>	838	<del>                                     </del>	allA
INSULATE STEAM LINES	A27	<del>                                     </del>	B26		NA
ETURN CONDENSATE	A28	<del>                                     </del>	.B27	<del> </del>	11/1
TRANSFORMER OVERVOLTAGE	A29	<del>                                     </del>		<del> </del>	NA
RANSFORMER LOADING	A30	<del>                                     </del>		<del></del>	NA
EVISE OR REPAIR HVAC CONTROLS	A31	<del>                                     </del>	B32	1.	· Close OA on Cabinetheaters (6)
WASTE HEAT RECOVERY *	A32	<del>  -</del>	- B33	+-	WA
ADD ADDITIONAL LIGHT SWITCHES	A33		B35	<del>- </del>	NA
NAC INIT/SLDGS WITH SEPARATE BOILERS	A34	1		+	WA
STANDARD SOLUTIONS for EXT LIGHTS	A35		836	<del> </del>	
BOILER OXYGEN TRIM CONTROLS	-~~		B24	<del>-</del>	N/A - photocella now
	<del> </del>	<del>                                     </del>	B25	+	NA
REVISE BOILER CONTROLS PRE-HEAT DHW	Â	<del>  </del>	<u>B22</u>	<del>-{</del>	WA
	A	<del>   </del> ,	B29	+	
EAT PUMPS EMCS		1 1	B39	+	Soo sperate Study
	A	<del>                                     </del>		+	Soo sperate Study
OT WATER RECIRC PUMPS	A	<del> </del>	M41	+	1
PS STREET LIGHTS LECTRIC OUTLET INSULATION	A	<del>                                     </del>	M42	<del> </del>	

c^> Denotes ECO's studied by Burns & McDonnel
<#> Denotes ECO's common to Military Family Housing

**** FMEA SIMIL	AR BUILDINGS SU	JRVEY FORM	***
NERAL BUILDING DATA		•	(10/92 3 (AJN)
LDG #:1850(P)BLDG NAME:LURVEYED BY:-DD- BLDG C LDG USE: CHAPEL # FL	ONTACT:	TFIFPH	JOB #: 124
DG OCCUPANCY: SMTW	Th F S 0730	70 0700 7 TO 1230	
STAT SETTING: HTG: 70 /	AUTO	SETBACK:	/ Y: <u>-</u> / <u>-</u>
emperature,Future,inside emperature,Future,inside	,0ccupied: 65/7	€ Tem - Air	p Present: 12 Change/hR: 0
RCHITECTURAL	AREA U	I <del>-v</del> alue	UA
WALL	6003	.071	426
GLASS ROOF		.176	1245
FLOOR		86	308
SUM	6,097		9,441
vg. Floor-Ceiling Height indow frame type: Alum indow size: x Entry doors: 8 # OH	SP DP CURT Doors: 8	Infil: of Area Co	tration L M H nditioned:
IGHTING: Type: Flyores	ent Incord. Watts	/SF: <u>2.28</u>	Jtil Frac:
ECTRICAL EQUIP: OFFICE	KW/Unit:#	Units:	Jtil Frac:
W: TYPE: NG/ELEC/CONY)	Supply Temp: 1 AFUE: 63/1 %	45° GAL/P	erson-Day:
CHANICAL			2001 7110
Primary System:	HEATING HTHW→ HW (		COOLING NONE
Fuel:	Nag (CP		10000
Capacity: est.Peak Del.Effic:	390 KBTU	4	
Months ON:	605,7(0		
Hours ON:	5808		
tus Hp:		<del></del>	
cfm: Min OA:	41000		
Economizer:	$\frac{20}{100}$		
SC:			
1- SINGLE ZONE UNIT			
I-MUAU I-HVU: IOKCEM, HEAT	CO11-336MQU		
( Lightly -> Some es	Bldg/-2359		
- 0			
		······································	

	JOB FT CARSON REAL	UPDATE .
	SHEET NO.	OF
E M C ENGINEERS, INC.	CALCULATED BY AJN	DATE 10-7-92
Denver • Colorado Springs • Atlanta • Germany	CHECKED BY	DATE
1-1850	SCALE	

HTHW control valve VI has Barber Colman Actuator Type A
- heating today, valve is working.
- Setpt. at 150°F

HW 3-way value working, controlled by T-STAT T-3 set et 80°F
'Act. Type MP-486

Separate Danper Motor for R.A. Danpen (Acts one Type B)

Air
System is Senetioning in Winter mode.

Syply fan SF-1 is off, as per control sequences

Face & Bypas Danper actuator IT B/C Type. F3

3-way value V-2 on Radiation circuit in openable (Very Lanky)

Radiation sump control set at 66°F. Shuts pumps off above 66°F.

AHUS serve the Sanctuary only. Radiation system serves the offices & Kotchen area only.

GENERAL BUILDING DATA  BLDG #: S-6270 BLDG NAME: Chine  SURVEYED BY: RT/RWW DATE: 27 NOV BA BLDG CONTACT: SP5 McEVOY  CONTACT TELEPHONE NUMBER: X 4221  BLDG USAGE:  TOT BLDG AREA: 12,361  SF # OF FLOORS: 2 # OF PEOFLE: 25 F100 people  Note: Drawings Show 11,494 SF  BUILDING OCCUPANCY: MON - FRI: 0700 TO 1630 FIRST SHIFT: (26 people portage)	· **(* **)
SATURDAY: SECND SHIFT: SUNDAY: TO THIRD SHIFT: HOLIDAYS:	. •
ENVIRONMENTAL CONDITIONS:  HEATING SETPOINTS COOLING SETECINTS	
WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  PRESENT T'STAT: 76 76 76 76  REQUIRED T'STAT: 70 70 70  THERMOSTAT LOCATION(S): None - Land operated Redicts Valves  HUMIDIFICATION REQUIREMENTS (RH): H'STAT LOCATION(S):	
LIGHTING:  AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE  1) 11,494 Aux and income. 1.33 ON 0700 OFF 1630  ON OFF  ON OFF  ON OFF  ON OFF  SEE ATTACHED SCHEDULE? X Y _ N See page 3  (est: 10% on A right)	
ELECTRIC EQUIPMENT:  AREA (SF) TYPE  1) 11,494	
INTERNAL MASS: MATERIAL: Equipment frame ESTIMATED MASS: _ () M, H)	
INFILTRATION, LOCATION(S): around windows, doors, attic Vents and through walls.	
ESTIMATED RATE:(L, M, H) or Building Volume = 120,687 CFCFM/LIN FT CRACK	
1.5 Air changes due to windows 0.25 Air changes due to doors and wells (.15 at night) 0.25 Air changes due to ceiling screen vents 2.0 Air Change total	

Bldg No.: 5-6220

Page <u>1</u> of <u>5</u>

GENERAL_BU	ILDING DATA		But I fam.				
CONSTRUCTI	⊓N:	• • • •	****		NET		ŧ,
WALLS:	CONSTRUCTION		WIDTH,	HEIGHT	AREA(SF)	U-VALUE	
N:	<u>concrete</u> bl	ock, airspure,	163.33' 44.66'	- <del>21'</del>	2995,2	0.24	
£ .2.	-panelling		163.33	-217	<u>578,8</u> 3006,8	O.24_ _O.24	
W:			44.66	21' -21'	631.0	0.24	
ROOFS:	CONSTRUCTION <u>Shiryle</u> Roof,	2 % " Blows	WIDTH 37.83'	HEIGHT (2.33	AREA (SF) 466.4	U-VALUE 0.069	
	Mulaton c	eilva brd	$\frac{32.33}{}$	163.337	5,280.6	0.069	
WINDOWS:	AREA (SE) T	XFE Now Min		rane Akm Ve			
N:	434,8 (2)	bl ha was	SP SP		DRAFES NO	18	
بيخريج	359.2 (**) 423.2 (***)			DF Z	DRAPES +	u=1.18	
	307		SF	DF D	DRAPES T	0	
		. <i>.</i>		<i>v</i> • .			
FLOOR TY				_ BASEMEN	T OTHE	三 长	
HIS	EA: <u>5,747</u> SF	(Y = 0.5	10,00				
PERIMET	ER:LF	INSULATION	?Y	NIN	. سر حت نظار جب جب عليا، كيا، كيا، حيا،		
SPECIAL ARE	<b>-</b>						
		" / A - ⁴ \		·	1	9	
ADDITIONAL	NOTES: (39	5 x 605)	- Wina	<u>lows</u> p	1111 51,5	X 16	
WODEN ULE	w panes 14	· reception	area	2 1/2	r 2 u/.		
					_	(1)	
	lives are						
therefor	- the crow	of space t	emografu	ne it os	timated 1	o be	
	ximately S				werd Se	reen Vout	ζ
are som	to the aft	R (6-21	"× 14.5	<b>"</b> ).			
•				/			
FILM #:	FRAME #						
SKETCHES:		, .v	1. A 11. A			•	
(20) 16	165F)+(B)(1.69	SF) H( )(12 SF) =	434,8	S.F			
£ (5)(47	6sf)+(8)(1.69 2 Sf)+(8)(13.4	1 sF) = 3597	2 SF				
(20)(16	.6 SF) t(12)(7.6	SF) = 423.	2 SF				
	2 sf) + (6)(13,			7 SF			
	- 3577 (6)(13)	אינו ד עונשים	7,12,00	, -,			

Bldg No.: 5-6220

Page Zof 5

^{*} Specify/in "Additional Notes"

<u> </u>	ZHL_!	ロコア ロ	TIME	T DHTH										
		SCHE											eo÷	
AREA:	(A)	MAIN	_11	, 494 ×		_SF		(B) ME (B)	zz_ 	X	SF			
DATA	SOUR	RCE:_	[	ORAWING	58	s	JR'	VEY TOUR						
Mark	; #3	, l'amps	1	W/Fix	!	#Fix	;	Flr # :			Comment	s		
C	T	Ø	1		T	Ø	7							-
														-
F	; ;	504	1	152	;	76	!	fluor:	<u>l</u>	1, 552	watts		(4 long)	hx)
G	;	60	1	76	!	30	!	fluor:		2,280	walls		(2 "	)
<u>H</u>	1	Ø	!		!	Ø	<b>!</b>	!						
J	1	ט	¦ 	76	:	5	:	fluor:		380	natts		(2 layurs)	/fix
K	i	l	ł	100	ł	1.	;	incomó!		100	waltz			
											watts		(4 lams/	(v)
M	:	6	!	30 <i>0</i>	;	2	; 	incard!		600	walts		(3 bulbs)	)
<u>Q</u>											walts.		(1 long/f	_
	:		!		;		!							
	!		;		!		1							_
	¦ 		: 		!		!							_
	1		ï		1		·	a <b>i</b>						
	:		7		ī		1							
(A) T0	DTAL:	:	<u>15</u>	336		Watt	:s	/!],	49	4	SF=/	.33	W/SF ·	
(B) T	STAL:	:				_Watt	: <u>=</u> ,	/			3F=		W/EF	

ADDITIONAL NOTES:

GENERAL BUILDING DATA
MISCELLANEOUS BASE LOADS:  MANUFACTURER & MODEL  FUEL SOURCE _NAT GAS _ ELEC _ OIL _ STM BEN _NOTHER*  SUPPLY TEMPERATURE
FUNCTION OF LIGHTS SECURITY PARKING LOT ENTRY OTHER*
ADDITIONAL COMMENTS: DHW from Steam from plant, 100° F
et tap, 105°@ tank (storage)
MISCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER & MODEL  FUEL SOURCE
· · · · · · · · · · · · · · · · · · ·
FILM #: FRAME #:
wainterned (wore or less) at 76 of during the winter worths. There is not a central thermostat

* Specify in "Additional Comments"

Bldg No.: 5-6220

Page 4 of 5

UNITARY UNIT NO.		EQUIPMENT: OUTPUT CAPACITY	HEATING SOURCE	CFM	HF	STARTER & CONTROL	SETPOINT
· ,				÷	•		
	Tue a	4 52 h	and solve	ted	steam	vadiators ceetly being capacity: (240 BTW/6	in the
	huil da	m. The ma	inity we	locate	مل لم	really boing	eath
	evieth.	مريد لمريد	15/10	h . : !	din.	Dana iste	- Tan Tan India ( )
		(5) - 1-1	1	Ct/		S40 RTW/L	c/c(+)
	<i>V</i> -=	(3 2 radia)	1001)(12 SC	. 11	aciara,	(50 Bishu	4.137.TL/
		= 629,0	200 BIL	^/touc			
	Control Va	lues on the	cast iron 1	adiator	s are	the old ham	d opented
	one 3/4	"in size;	connection	to vad	iator =	the old ham	3/4"nipple
							4. pipe(supply)
FILM #:		FRAME #: _					<b></b>
NOTES:	TYPE>	unit heat wall furn		entilat	or, du	ct furnace,	
	HEATING	SOURCE>	electric.		red, o	il, steam,	
	STARTER	& CONTROL		ary, ma		ed, line v tained, etc	

Bldg No.: 5-6220

MECHANICAL EQUIPMENT DATA

Page 5 of 5

	•						_
	***	FMEA SIMIL	AR BUILDINGS	SURVEY F	ORM	****	(
LENEI	RAL BUILDI	NG DATA	cia Medical Sup	ply Office	12	(10/92) AJN	
BLDG SURVI BLDG	EYED BY: D USE:ADM +	BLDG NAME: H D BLDG CO PHARM. # FLO	ONTACT: DORS: I # PE	DATE:	BLDG ARE	JOB #: 124 EXT: A: 5798 SF Jue: (9:00 -1630) & Fri 1. 9:00-1200	
BLDG	OCCUPANCY	SMTW	Th F S O	TO TO	2300 W.	1. 9:00-1200 Ur. Closed	
T'ST	AT SETTING	i: HTG: 76/ CLG: —/	AI			:/	
Temp	erature.Fu	iture, i <u>nside</u> iture, inside	סכcupied:ס,			resent: <u>76°</u> nge/hR: <u>1.92</u>	
ARCH	ITECTURAL		AREA	U-valu	e	UA	
	,	ROOF FLOOR	3, 365 663 5312 5313	.229 1-176 .074 .41	7 78 39 21 413	22	÷
nd nd # En	low frame 1 low size: try doors:	lling Height type: Alum Soe Below : 2 # OH	9.8 Flo	or type: ( perable s URD _ % of A	ins. Ins. ections: Infiltra rea Condi	sulated: Y/N  () / N  ation L(M) H  tioned:	(
		:FLUOR 76-				1 Frac:	
ELEC	TRICAL EQU	JIP:OFFICE					
DHW:	TYPE: NG	/ELEG/CONV	Supply Te AFUE:	mp:	GAL/Pers	son-Day:	
MECH	IANICAL		HEATI	NG	COC	LING	
	Primary : Fuel: Capacity	•	HTHW > STI		4 SWAM Electr	P COOLERS	
AHUs	Months Ol Hours ON		68.86.% D 5808		4 2 <del>9</del> 52		
	cfm Min	: OA: nomizer:					
MISC		100/NS - UK	."×67"				
		ER - TOO HOT		, Too coo	L IN FRO	nt netion	(
1. (10)	(-En)		eam) w/ TSTA	T Control or	Wall		
	6 - RAD	ingoes w/ origine					

	***	FMEA S	SIMILAR	BUILDIN	GS SURVEY	FORM	***
	RAL BUILDI			<i>c</i>			10/92
SHRVE	#:6222 (S) EYED BY:AM USE: CLINIC	MACNA /BI	_DG CONT	ACT: < </th <th>. REAULIEI</th> <th>ILLEPHUN</th> <th>JOB #:124 E EXT:4320 EA: 9225 SF</th>	. REAULIEI	ILLEPHUN	JOB #:124 E EXT:4320 EA: 9225 SF
BLDG	OCCUPANCY:		T W Th		0730 T0	1600	
T'ST/	AT SETTING:	: HTG:_ CLG:			AUTO SETBA	.ck: ₩ /	Y:
Tempe Tempe	erature,Fut erature,Fut	ture, ii	nside, Oc	cupied:	70/78 d: <u>\$5</u> /-		Present: <u>70</u> ange/hR: <u>1.92</u>
ARCH	ITECTURAL	WALL GLASS ROOF FLOOR SUM	2,2 8,4	AREA 127 20 -16 -16	U-valu .229 1.176 .074	z 	UA -,159 -,611 -,623 -451 -844
inde inde En	Floor-Cei ow frame ty ow size: try doors: TING: Type:	ling Ho pe: See R	eight: 9 Alum () elow () # OH Do	FI DP Dors: O	Operable s CURT % of A	C.S. In sections: Infiltr area Cond	sulated: Y/N/  Y/N  ation LMH  itioned:
	TRICAL EQUI	-			#Units		•
	TYPE: NG/	<u>`</u>	ONV) S	Supply T SFUE:	<del></del>		son-Day:
MECH	ANICAL			HEAT	ING	CO	OLING
	Primary Sy Fuel: Capacity: est.Peak I	)el.Ef			IM (OOU. CP)	3-5WAN	AP COOLERS
AHUs	Months ON: Hours ON: Hp: cfm: Min (			5 58 <i>0</i> 8 =		<u>7952</u>	
MISC	: W/N	1D0W5	: 98 -	40"×6	z"; 37-	- zo"x6z	<u>"; 16-31"x6</u> z"
					,		

	***		LAR BUILDING	S SURVEY	FORM	****	0/92	
BLDG	ىلم:EYED BY	BLDG NAME:	Directorate of ( HOSP. CLINT CONTACT: MR. LOORS: 1 # 1	E DATE:	TELEPHONE	JOB #:12 EXT:46	4- 90	
BLDG	OCCUPANCY	SMTW	Th F) S	6730 <del>0715</del> TO	430 <u>4600</u> ———			
Temp	AT SETTING	CLG: ture,insid	/		Temp P		78.	
	ITECTURAL		AREA	U-valu	e	UA		
	•	GLASS_ ROOF_ FLOOR SUM	4,561 1,073 84   6 8,416 22,466	1.176 1.176 .074 .41	1,2 6,34 6,3	62 23 51		
ind //nd	Floor-Cei ow frame t ow size: try doors:	ype: Alu Soe Book 4 # 0	t: 9.8 F16 m Word 1 DP (0 H Doors: 0	% of A	C.S. Ins	ulated: (Y) / N tion L	Y/Ñ м н	
LIGH	TING: Type	:FLUO. 36-2	LAMP 34WATT	Watts/SF:_	Uti	1 Frac:_		
ELEC	TRICAL EQU	IP:	KW/Unit:	#Units	: Uti	l Frac:_		
DHW:	TYPE: NG/	ELEC/CONV	Supply To	emp: <u>12<i>0</i>°</u>	GAL/Pers	on-Day:_		
MECH	ANICAL		HEAT	ING	COO	LING		
	Primary S. Fuel:	ystem:	Nacco	2)				
	Capacity: est.Peak	Del.Effic:	63.86 %					
	Months ON Hours ON:	•	Some		<u>4</u> .2957		<del></del>	
AHUs								•
	Min	OA: omizer:						
MISC			WD!!!	.// //- "	12412	2.4	<i>u</i> ,	
	MINI	16 2 1400	- 40"x 55"; - 20"x 62"	41-40 X	66,8-	· 31 X 62		
Carrier State								i

					• •
***	FMEA SIMILA	R BUILDINGS	SURVEY	FORM	****
NERAL BUILDI					(10/92)
(C)	BLDG NAME:	lm. Gren. Purpose			AON
IDVEYED RY	RIDG COL	ITACT: SPA	ш 11)	<del>2-15-8</del> ; TELEPHO	NE EXT: 3516
DG USE:	ELINIC # FLOO	RS: 2 # PE	PLE:	BLDG /	REA: 24549 SF
DG OCCUPANCY			л 40 реод 30 TO -	la.	
,bu ooo, mo	SMTWT	i F S	T0		
STAT SETTING	: HTG: 80°/-	→ AU	TO SETBA	CK: (N)	/ Y: <u>/</u>
•	CLG: 7/7 / -		•		Present: 78°
emperature,Fu	ture, inside,	Jnoccupied:	<u> </u>	Air	hange/hR: <u>1.92</u>
RCHITECTURAL					
TONE ! COTORNE		AREA	U-valu	<u>e</u>	UA
	WALL 12 GLASS 2	386	1176		2,836 2,996
	ROOF II	416	074		845
	CIIM 37	<u>416                                    </u>	41		4681 11.358
	<u> </u>	Pa. P	ane Num.	Jert, and S!	Insulated: Y/N
/g. Floor-Cei indow frame t	ling Height: ype: _ Alum	7.8 / F100	r type: erable s	ection:	insulated: 1/N/ s: (Y) / N _
ndow size:	So Below Y	SET OP CU	RT)	Infil'	tration L(M)H
		. ^			nditioned: 100
GHTING: Type	:FLUO. 110-2 LA	MP Wa	ي: tts/SF	,44	Jtil Frac:
ECTRICAL EQU	IP: K	W/Unit:	#Units	:	Jtil Frac:
HW: TYPE: NG/	ELEC/CONV	Supply Tem	o:	GAL/P	erson-Day:
ECHANICAL		AFUE:	_%		
	<u> </u>	HEATIN			COOLING
Primary S Fuel:	ystem:	HTHW > STM	Conv		AMP COOLERS
Capacity:					
est.Peak Months ON	Del.Effic:	65.86 %	<del> </del>	4	
Hours ON:		5808		295	52.
HUS Hp:_					
cfm: Min					
	omizer:				
T.C.C.					,
ISC: Win	DOWS: 91	- 40"x 6z"	24-	20"x6	2";
	SE	-31" × 62"			
Cast La	on Radiators w	13/4 Honeu u	vell radiat	or control	Valves. (COVERER W
South					Bidgis extremely
2001/					

****	FMEA SIMIL	AR BUILDING	S SURVEY	FORM	****
NERAL BUILD	ING DATA	_			(10/92)
BLDG #: <u>6233</u> SURVEYED BY:A BLDG USE: <u>O.R.</u>	BLDG NAME:	UACAUT OSP CLINE ONTACT: SP OORS: 2 # 1	DATE: WHITE PEOPLE: 18	2-14-85 TELEPHONE BLDG ARE	JOB #: 124
BLDG OCCUPANC	Y: SMTW SMTW		1600 TO		
T'STAT SETTIN	G: HTG: 78/ CLG: //	/	AUTO SETBA	CK: N / Y	·:/
Temperature,F Temperature,F	uture, inside	,Occupied:	16/78 1:55/-		resent: <u>18</u> inge/hR: <u>1.92</u>
ARCHITECTURAL	•	ADEA	U-valu		UA
	WALL	AREA 15911	.229	<u>e</u>	3,644
	GLASS ROOF	10,800	1.176		799
	FLOOR SUM	10,800	.41		1,428
		39,726			476
Avg. Floor-Ce indow frame indow size: # Entry doors	type: Alum	Wood (P)	operable s CURT	ections: Infiltra	
LIGHTING: Typ	e:FLUO. 8-1L/	LAMP 34W I	watts/SF:_	<u>30</u> Uti	1 Frac:
ELECTRICAL EQ	uip:office	KW/Unit:	#Units	: Uti	1 Frac:
DHW: TYPE: NG	/ELEC/CONV	Supply To	emp:	GAL/Pers	on-Day:
MECHANICAL		HEAT		coo	LING
Primary Fuel:	System:	HTHWYS	LW Court	2. TRAN	E ACU
Capacity		NAG (CE	<del></del>	Elect	<u> </u>
	Del.Effic: N:	68.86%			
Hours ON	:	5808		- 5.6.1	
AHUS Hp:				7.5 H.	<u> </u>
	OA: nomizer:				
MISC:		<del></del>		<del></del>	
	NPOWS : 1	27-40"×62	"; 2-38	3"x52"	
2 TRAN					
Appears	to have manual red.	control valves.			
_ Entire	bidg. locked up				
PAGE L of	<u></u>	<del></del> ,			-

11.5.	***	FMEA SIMILA	R BUILDING	S SURVEY FO	RM *	***	
	AL BUILDI				1	(10/923 AJN)	·
BLDG	#:6236	BLDG NAME: He	IACANT SP CLINIC	DATE: 2	14-85 JC	IB #: 124	
SURVE	YED BY:AN	FAMA BLDG COL	NIACI:SP4 /	HAMBELAIN TE	LEPRUNE E	XT: <u>2414</u> 19988 SF	•
				730 TO 16	- Fn	tire Bldg lock	cel up
BLDG	UCCUPANCE	SMTWT	h F S	10 TO			
T'STA	T SETTING	: HTG:78/_	A	UTO SETBACK	: N / Y:	<u> </u>	
Tempe	erature,Fu	CLG:/_ture, inside,	<u> </u>			sent: 74	
Tempe	erature,Fu	ture,inside,	Unoccupied	<u>'\$5/-</u>	AirChang	je/hR: <u>1.92</u>	
ARCHI	TECTURAL		AREA	U-value		UA	_
	<b>.</b>		7,826	.229	2,2		
			1320	1.176	2,8		
·	•	FLOOR C	1320	,41	387		
			5,8 <b>5</b> 7	***************************************	9,57		
Avg.	Floor-Cei	ling Height: ype: Alum	98' Flo	or type. <u>.</u>	S Insui	ated: Y/	/
nde	IW CIZO.	\00 :\S01~.\	א טפ ט	UKI I	minitati	יו עיו ב	×.
# Ent	try doors:	<u>5</u> # 0H	Doors: Ø	_ % of Are	a Conditi	ioned: <u>100</u> 9	<b>%</b>
LIGHT	TING: Type	:FLUO 8-11AM	MP 34W W	atts/SF: <u>.3</u>	<u>5</u> Util	Frac:	
ELEC1	TRICAL EQU	IP:OFFICE K	W/Unit:	#Units:_	Util	Frac:	
DHW:	TYPE: NG/	ELEC/CONV	Supply Te	mp:G	AL/Perso	n-Day:	
МЕСП	ANTCAL		AFUE:	%			
MECHA	ANICAL	•	HEATI	NG	COOL		
	Primary S Fuel:	ystem:	CENTRAL		<u> </u>	NE	
	Capacity:		noad. C	<i>X</i> ,			
	est.Peak	Del.Effic:	69.86.%				
	Months ON		8000				
AHUs	Hours ON: Hp:		5808				
Allus	cfm:			<u> </u>			
	Min						
	Econ	omizer:				4	
MISC	:			. ,,	, , ,	_ 11 / 11	
	WIN	DOWS: 15	- 31 x 54"	; 107 - 40"	×62"; 28	3-31 x 62"	1
	Double a	cane windows -	Alum. Verti	and sliders. c	aulked.		i
*		e ordrol values.					,

****	FMEA SIMI	.AR BUILDINGS SURVE	/ FORM ****
ENERAL BILL	LDING DATA		(10/92)
BLDG #:623	BLDG NAME:	CONTACT: <u>SSG_LEE</u> LOORS: <u>2</u> # PEOPLE: <u>6</u>	Z-14-85 JOB #:124 TELEPHONE EXT: 4326 O BLDG AREA: 19988 SF
BLDG OCCUPA	ANCY: SMTW SMTW	Th F S 0630 TO	1730 S. Entire Bldg  Locked up.
T'STAT SETT	TING: HTG: 78	AUTO SETE	BACK: 🕅 / Y: <u></u> /
	Future, inside	e, Occupied: 70/78 e, Unoccupied: 55/-	Temp Present: 78° AirChange/hR: <u>1.92</u>
ARCHITECTUR	RAL	AREA U-vai	lue UA
•	WALL GLASS	9.826 .229	2,250
	ROOFFLOOR	2;39/ 9320 9320 9320 41	
	SUM	36, 857	9,573
indow fram indow size # Entry doc	ne type: Alun e: چوهکاهاهی	Wood) Operable Se OP CURT Doors: Ø % of	Sections: (Y) / N Infiltration L (M) H Area Conditioned: 100
_			: <u>.84</u> Util Frac:
	NG/ELEC CONV	<del></del>	GAL/Person-Day:
MECHANICAL		HEATING	COOLING
Primar Fuel:	y System:	CENTRAL PLANT NGG (CP)	NONE
Capaci	eak Del.Effic: ON:	BH %	
AHUS I	fm:	5000	
	lin OA: Conomizer:		
MISC:			
	VINDOWS: 15	- 31" ×54", 107 -	40" x 62"; 28-31" x 62"
	dows are double s		Ked

PAGE _

of

*	***	FMEA SIMIL	AR BUILDII	NGS SURVEY F	ORM *	***
	L BUILDI		-			(10/92) AJN)
BLDG # SURVEY BLDG U	: <u>6243</u> ED BY: AM SE: HOSP	BLDG NAME: J WWWBLDG C WARD # FL	105 P. CLIN CONTACT: .00RS: 2 #	DATE:	2-13-85 JO ELEPHONE E BLDG AREA:	B #:124 XT: 25490SF
BLDG O	CCUPANCY	S M T W	In F S Th F S	<u>0730</u> TO 1	640	
r'stat	SETTING	: HTG: 75/	<u> </u>	AUTO SETBAC	K: 🐧 / Y:	/
Temper Temper	ature,Fu	ture, inside	Occupied.	: <u>70/</u> 18 ed: <u>55/-</u>	Temp Pre AirChang	sent: <u>74</u> je/hR: <u>1.92</u>
ARCHIT	ECTURAL		AREA	U-value		U.A.
4. 2.		WALL	16,352	.229	3,74	5
• . <u></u> .	:	GLASSROOF	<i>1;774</i> \$212	1.176	<u> </u>	6
***		FLOOR	8212	_,41	336	
•			34,550			
indow indow # Entr	frame to size: y doors:	ype: Alun <u>Soe Below</u> 6 # Ob	n Wood €P DP 1 Doors:_Ø	loor type: <u>C</u> Operable se CURT % of Ar	ctions: Y Infiltrati ea Conditi	on L M H oned: 100
LIGHTI	NG: Type	:FLUORESCE	ENT	Watts/SF:	3 Util	Frac:
ELECTR	ICAL EQU	ip:offkē	KW/Unit:_	#Units:	Util	Frac:
DHW: T	YPE: NG/	ELEC/CONV	Supply AFUE:	Temp:	GAL/Persor	ı-Day:
MECHAN	ICAL		. <u></u>	TING	COOLI	NG
	rimary S	ystem:	CENTRA		1001	
	uel: apacity:		NaG		<del></del>	
e	st.Peak	Del.Effic:	68.86	%		
	lonths ON	•	<u> </u>	2		
	lours ON: Hp:		500	<u> </u>		
	cfm:					
	Min					
	Econ	omizer:				4
MISC:			_	<i>u</i> ,		
_	W!	NPOWS:		40"x62"		
_		ndars - Double p ant · 2nd FLR		162 7:K1-4:	00pg 60 707	5 partiet pers
ノ	131 FUR VAL	on charac	(In a mocessin		10 TO 11	staff
_	Marval Co	ntrol valves.		<i>D</i> *		
	IST FIRE	occurpied summa	ronly - Reser	vists, but could c	hange.	

PAGE

of

1	GENERAL BUILDING DATA  Temp. Barracks: Top Fire 1st Fire No. Wing. appears to be an abandon Day care.  BLDG #: S-6230 BLDG NAME: Waxd (Hospital)  SURVEYED BY: PT/PWW DATE: 27 NOV CA- BLDG CONTACT: Maj. Hundison.  CONTACT TELEPHONE NUMBER: Y 4294 BLDG USAGE: Declatrics/Siwgical  TOT BLDG AREA: 21,450 SF # OF FLOORS: 2 # OF PEOFLE: 45 + 50 part  (Drawings show 18,264)  BUILDING OCCUPANCY: MON FRI: 1000 TO 2400 FIRST SHIFT:  SATURDAY: TO FRIED SHIFT:  SUNDAY: TO WHOLIDAYS:
	HEATING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  PRESENT T'STAT: 76 76 76  THERMOSTAT LOCATION(S): Nove Land opened Steam Religious  HUMIDIFICATION REQUIREMENTS (RH): H'STAT LOCATION(S):
	LIGHTING:  AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE  1) 21,450  2) ON 000 OFF 2400  ON 0FF  ON 0FF  ON 0FF  ON 0FF  ATA SOURCE: OBSERVATION ASHRAE OTHER  SEE ATTACHED SCHEDULE? Y X N Son Regards
	ELECTRIC EQUIPMENT:  AREA (SF) TYPE  1) 21,450
	INTERNAL MASS: MATERIAL: Equipment/frame ESTIMATED MASS: _ (1) M, H) INFILTRATION: LOCATION(S): around windows and though wells.
	ESTIMATED RATE:  (L. M. H) or  Building Volume = 73,056 CF  AIR CHANGES OF  CFM/LIN FT CRACK  1.5 Arr Changes due to windows  1.15 Arr Changes due to walls (No exterior doors in active use)  1.65 Total air Changes

Bldg No.: 5-630

Page 1 of 5

GENERAL BUILDING DATA	
NSTRUCTION:	
WALLS: CONSTRUCTION COMPONENT WIDTH HEIGHT AREA(SF) U-VALUE	
N: Convete Work Ansper, 42.3/10 21/21 _ 767 _ 0.24	
252 21 4,468 0.24 42.3/10 21/21 - 767 0.24	
W:	
ROOFS: CONSTRUCTION COMPONENT WIDTH HEIGHT AREA (SF) U-VALUE	
Suiry e Root, 3/2 Blows 262 32,3 -8,465 - 6,069	
insulfina, Cellinghound. $\frac{10}{10}$ $\frac{27.67}{39.3}$ $\frac{276}{39.3}$ $\frac{0.069}{0.069}$	
Trial 9 132 0.069	
WINDOWS: AREA (SF) TYPE - New double pane Alum. Vert. Sliders	
WINDOWS: AREA (SF) TYPE   DP _ DRAPES	
E 8: R24(FE) SP DF DRAPES	
SE: 332(9) SF DP DRAPES	
W: _800(*** SF DP DRAPES	
FLOOR TYPE:SLAB _X CRAWL SPACE BASEMENT OTHER*	
AREA: 9132_SF U= 0.4098	
FERIMETER:LF INSULATION?YNIN	
SPECIAL AREAS: / CO / /	
DITIONAL NOTES: Exclosed walkness bring touthe to the	
building therefore no intiltration is attributed to	
Loors. The conesed valknage are not included in	
- this analysis	
Note: Much of the buildings area is locked and not used.	
It is assumed that lost is still supplied to there areas.	
FILM #:FRAME #:	
SKETCHES:	
(2)(32)+(2)(24)+(2)(40)+(2)(30) = $332 SE$	
(49)(16)+(10)(12) = 824 SF	
CANALAND SUPSE	
(32)(16)+(18)(12)+(6)(12) = 800 SF	

Specify in "Additional Notes"

Bldg No.: 5-6230

GENEZE	F ROIL	DTIZE_1	5070						
LIGHTI	ING SCHI	EDULE						Pag	eof
AREA:	(A) MAII (A)	N>	·	_SF 	(B) MEZ (B)	ZX		_SF 	
DATA S	SOURCE:	DRA	AWINGS	SURVE	Y TOUR				
Mark !	#lamp	s : W/	Fix :	#Fix   F	1r # :		Comm	ents	
	.62	1 /	76	3/		335C	watts	(2 lan	Augrescent
. {	146	.1 4	48 !	73 !	1	3,504	walls	(1 lang	2 Huonescent)
		!	!						
. 1		l. 	.	!	Total	5860	walls		
		!		·"	!			· · ·	
		. !							
:		; .	1	1	!	Appro	skmeto	4 80%	of the
		1					lts	lere o	est at
		!		:			all	Ames	
		:	!	: 	!	Total	weth	used = (	<u>0.2</u> ( 5860 w)
		!	·	100	,cupacy !				1,172 matts
FEST	. 0.64	W/SF )	x(21450	× 0.75+) =	= 10, 29	6 W			
	10,296	w1:10	oow i	10.296 Kw	÷ 0.0034	3 BTUH	: ,		
;				BTOH TOT.		, oc			
(A) TO1	ΓAL:	1,17	2	_Watts/_	21,	,450	SF=	0.655	W/SF
(B) TOT	ΓAL:			_Watts/_			8F=		W/SF
ADDIT	ONAL N	OTES:							



THERAL BUILDING DATA
.1SCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER & MODEL  FUEL SOURCE NAT GAS ELEC OIL STM GEN OTHER*  SUPPLY TEMPERATURE 'F, DISTANCE FROM HEATER FT  INPUT RECOVERY RATE OPERATING SCHEDULE
EXTERIOR LIGHTING:  TYPE NO SCHEDULE CONTROL  TOTAL KW SCHEDULE FARKING LOT ENTRY  OTHER*
ADDITIONAL COMMENTS: DHW from Stean Heating Plant . DHW is
100°F at taps, storage tout temp is 105°F.
Note: The wood windows in this building we leaky but are quite a lit tighter than most of the temporary
are quite a lit tighter than nost of the temporary
building undows (made of wood).
Misc. Thernel Gains: ~ 300 BTUH at 0.44 schoole factor.
FILM #: FRAME #:
ADDITIONAL SKETCHES:
adiators are operated by hand
Note: the buildings steam radiators are operated by hand values. We estimate that the space temperature is mainstained at 76°F during the winter months. There is not a central themostat for the building.

MECHANIC	CAL_EQUIP	MENT_DATA						•
UNITARY UNIT NO.		EQUIPMENT: OUTPUT CAPACITY	HEATING SOURCE	CFM	HF	STARTER & CONTROL	SETPOINT	
							خباة والدر وجو وجو حوي وساء ويوا الدو	
							<u></u>	
	Those	 اا مده	8 hand	sport.	, d .	team radi	tous in	
	برات ماره	hildm	Ale mai	on the	ue 19	pested dir	cetly benea	th
	انده	24ho inc	loure. Total	el Cara	, Fly :		7	
		31119	= (118 1	edictors)	2:50	soft/redute	Yzyo ways	(F)
~	نهٔ حف حب جب جب بین بین بین	7	= 1,416,00	00 BTU	160	7		
		. <u> </u>	4					
		•						
NOTES:		wall furn	ace, etc.			ict furnace,		
		SOURCE>	hot water	, etc.				
<b>.</b>	STARTER	& CONTROL				ned, line v ntained, etc		ko maja sel
, 	S-6	730				De	5 of 5	
Bldg No	.: <u> </u>					rage _	<u> </u>	JOH IT

•				
**** F	MEA SIMILAR BUILDIN	IGS SURVEY FORM	****	4
GENERAL BUILDING	DATA		(10/923 AJN)	
SURVEYED BY: AM/W	DG NAME: <u>HOSP CLIN</u> W BLDG CONTACT: <u>DR.</u> LNIC # FLOORS: 2 #	<u>CASTLE</u> TELEP	95 JOB #: 124 HONE EXT: 4460 AREA: 20075 SF	
BLDG OCCUPANCY:	SMIWTHFS SMIWTHFS	0730 TO 1640	Entire Bldg. is Vac	art
Temperature, Futur	HTG: 78 / — CLG: — / — re,inside,Occupied: re,inside,Unoccupie	107.0	mp Present: rChange/hR: .57	
GI R( <u>F</u> 1	AREA  10, 252  LASS 1, 965  00F 9320  UM 30,857	U-value ,229 1.176 ,074 ,41	UA 2,348 2,311 690 3821 9,170	
vg. Floor-Ceilig ndow frame type ndow size: # Entry doors: 4	e: Alum Wood  DP DP	loor type: <u>C.S.</u> Operable sectio CURT Infi % of Area C	ns: (Y) / N Itration L (M) H	(
LIGHTING: Type:FL	UORESCENT	Watts/SF:	Util Frac:	
ELECTRICAL EQUIP	:OFFICE KW/Unit:_	#Units:	Util Frac:	
DHW: TYPE: NG/EL	EC/CONV Supply TAFUE:	Temp: GAL/	Person-Day:	
Primary Systuel: Capacity: est.Peak De Months ON: Hours ON: Hours On: Cfm: Min OA	1.Effic: 68.86 9	FING STM (Onv.	COOLING	
Double pare	1 zer:			ĺ
Nacional	To love the control of			

∧ £

)

		•								
		***	FMEA SI	MILAR	BUILDIN	GS SURVEY		****		
T		AL BUILDI			AJ1		. /	entacta Nillie Wheelev		***
	SURVE	YED BY WA	U/ALAA BIT	OG CON	CEIN TACT:	E DATE	TELEPH	85 JOB #: 1		
	BLDG	USE: HOSP	WARD	# FL00	RS: <u>2</u> #	PEOPLE: <u>14</u>	11a 5 C2	AREA: 20143 30-50-15	~ // · · · -	
	BLDG	OCCUPANCY	: S M 1	W Th	F S	<del>0730</del> T0	1640	ZWKS/AND - ZWKS/AND - (A/60 people M	· · · · · · · · · · · · · · · · · · ·	
	T'STA	T SETTING	: HTG: 7	<u> </u>		AUTO SETB	ACK: 🕅	/ Y:/	<del></del>	
	Tempe Tempe	rature,Fu rature,Fu	ture.ins	side.0	ccupied:	70/78 d: <u>55/-</u>		np Present: rChange/hR:		
	ARCHI	TECTURAL			AREA	U-val	ue	UA		
			WALL GLASS		,826 ,397	.229		2,250		
		•	ROOF	93	320	.074		690		
			FLOOR SUM		320 857	<u></u>		.9573		
	Avg. indo indo # Ent	Floor-Cei ow frame t ow size: cry doors:	ling Herype: Soe Beli	ight: Ġ Alum [ w & # OH D	1.8' F1 Wood) P DP oors: <u>Ø</u>	oor type: Operable CURT 2 of	C.S. section Infi Area C	Insulated: ns: ① / N ltration londitioned:	: Y/® : LOOO%	
	LIGHT	ING: Type	:FLUORE	SCEN	70	Watts/SF:	43	Util Frac		
								Util Frac		
		TYPE: NG/	ELEC/COI		Supply TAFUE:	Temp:%	GAL/	Person-Day:		
	MECHA	NICAL			HEAT	ΓING		COOLING		
		Primary S Fuel:	ystem:_			STM Conv.		NONE	•	
		Capacity: est.Peak		 16	GB.86.9					
		Months ON	:	··· -	8					
	AHUs	Hours ON: Hp:			5200	3				
		cfm:								
		Min Econ	omizer:							
	MISC		•	·	////			- "	4. 1.04	
			le pane u	rindous -	31 x 54 Hum. Vert	Sliders, caulk		2"; 28-31	X62	i .
<b>T</b>	.)		n cinadahan	A VA loci	ses Itraini	ha portor.	.V1		- · · · · · · · · · · · · · · · · · · ·	
		Just f	joinished re	novation	in June.	All vardiate	is control	lled by Honeyn	rell C. V.s.	
			·						<del></del>	

PAGE 1

of L

****	FMEA SIMI	LAR BUILDIN	GS SURVEY FOR	M ****	
NERAL BUIL	DING DATA				•
BLDG #:6235 SURVEYED BY: BLDG USE:HoS	(S) BLDG NAME: AN/WW/BLDG P. CLINIC # F	HOSP CLIN CONTACT: LOORS: 2 #	IC DATE: 2- TEL PEOPLE: 18 BL	<u> S-85</u> JOB #: <u>124</u> EPHONE EXT: DG AREA: <u>20075</u> SF	
BLDG OCCUPAN		Th F S	0730 TO 164	19 FLR south wo Onthopedic Brace rost of bldg lockied	eshap.
T'STAT SETTI	NG: HTG: 76		AUTO SETBACK:	€ / Y: <u></u> /	4 reads
Temperature, Temperature,	Future, insid	e,Occupied:	<u>70/78</u> d: <u>55/-</u>	Temp Present: 72 AirChange/hR: ,57	Brace Sh
ARCHITECTURA	<u>L</u>	4054	11	11.6	
	WALL	9,851	U-value .229	2256	
	GLASS ROOF	7,366	1.176	3'782	
	FLOOR	9320	41	382	
•	SUM	30,857		_ 9,549	
Avg. Floor-C indow frame indow size: # Entry door LIGHTING: Ty	500 Ratow s: 5 # 0	M (Wood) SP DP H Doors: Ø	Operable sect CURT Ir % of Area	Insulated: Y/® :ions: Ø / N ifiltration L M H Conditioned: L M S  Util Frac:	
	•			Util Frac:	
DHW: TYPE: N	G/ELEC(CONV)	Supply T AFUE:	emp:GA	L/Person-Day:	
MECHANICAL					•
Primary	System:	HEAT CENTRAL F		COOLING	
Fuel:			CP)		
Capacit	y: k Del.Effic:	79.01 0	<del></del>		
Months	·	<u>68.96 9</u>	<u> </u>		
Hours O	N:	5808			
AHUS Hp				· · · · · · · · · · · · · · · · · · ·	
Mi	n 0A:				
Ec	onomizer:				
MISC:		4	ull al	. 4	
W/		20-31"x s	54; 46-4	10"x 62";	
//	1 / > 4	36-31"x	<u> </u>		

Double pane - Alum. Vertical sliders caulked - Windows

	***	FMEA SIMIL	AR BUILDI	NGS SURVEY F	ORM *	***
ENE	RAL BUILDI	NG DATA				
BLDG SURV BLDG	#:6240 EYED BY:AM USE:Host	BLDG NAME: 4 WW BLDG C	HOSP CLIN CONTACT: .00RS: 2 #	DATE: 7	2-15-85 JO ELEPHONE E BLDG AREA:	B #: <u>124</u> XT: <u>199<i>6</i>9</u> SF
BLDG	OCCUPANCY	SMTW SMTW	In F S Th F S	0730 TO 1	640_	
T'ST	AT SETTING	: HTG: 78	<del></del> .	AUTO SETBAC	K: 00 / Y:	/
Temp Temp	erature,Fu erature,Fu	CLG:/ ture, inside ture, inside	o,Occupied e,Unoccupi		Temp Pre AirChang	sent: <u>74</u> e/hR: <u>.57</u>
ARCH	<u>ITECTURAL</u>	WALL	AREA 9,851 2,366 9320 9320 30,857	U-value ,229 1.176 .074 .41	2,25 2,78 69 386	
ind ind # En	low frame t low size: _ itry doors:	6 Below # 01	t: 9.8 / F n [ <del>Wood</del> ) SP DP H Doors: <u>p</u>	loor type: <u>C</u> Operable se CURT % of Ar	S Insulctions: (f) Infiltrati ea Conditi	/ N on L (M) H oned:
LIGH	ITING: Type			Watts/SF: 2	•	
ELEC	TRICAL EQU	IIP:	KW/Unit:_	#Units:	Util	Frac:
DHW:	TYPE: NG/	ELECTON	Supply 'AFUE:	Temp:	GAL/Person	-Day:
MECH	Primary S	ystem:	HEA CENTRAL	TING PLANT	1000 1000	
AHUs	Months ON Hours ON: Hp: cfm: Min	Del.Effic:	N26 (	(CP) 76 B		
MISC		Dava/5 1 1	96 - 45"\	112" . 70 -	3/"x=4"	36-31"x62"
	IST FLOOR E2nd	No. Wiha. USA	tisc Informational hard values entire	ion Coaster (7:30 re bldg. Now man	- 4:30)	

PAGE ___ of __

		•				
٠,	***	FMEA SIMIL	AR BUILDING	S SURVEY FOR	M ****	
	ENERAL BUILDI	NG DATA				10/92 VIN
.41 <u>71</u>	BLDG #:6244 SURVEYED BY:4M BLDG USE:HOSP	BLDG NAME: I	ONTACT:	TEL	13-85 JOB #:	24
	BLDG OCCUPANCY	: SMTW SMTW		0730 TO 16 TO	40_	
	T'STAT SETTING	CLG: — /			<pre></pre>	
	Temperature,Fu Temperature,Fu	ture, inside	,Unoccupied.		AirChange/hR:	
	ARCHITECTURAL		AREA	U-value	UA	· · · · · · · · · · · · · · · · · · ·
	•	WALL GLASS ROOF FLOOR SUM	9,885 2,332 9320 9320 30.857		2,264 2,742 690 3921 9,517	
	Avg. Floor-Cei Vindow frame t indow size: # Entry doors:	ling Height ype: Alum	: 9.8 Flo Wood 0	perable sect URT In	ions: (Y) / N ofiltration L	. 🐠 н
	LIGHTING: Type	:FLUORES	LENT 1	latts/SF: <u>43</u>	<u>S</u> Util Frac:	
	ELECTRICAL EQU	IP:OFFICE	KW/Unit:	#Units:	Util Frac:	
	DHW: TYPE: NG/	ELEC CONV	Supply Te		L/Person-Day:	<del></del>
	MECHANICAL	٠	HEATI	NG .	COOLING	
	Primary S Fuel: Capacity: est.Peak Months ON	Del.Effic:	CENTRAL NOG	PLANT _	NONE	
	Hours ON: AHUS Hp: cfm: Min	0A:	5808			
	MISC:	omizer:			"	<del></del>
	Now & Red Cross of	MDOWS: windows - doub on 15T FLR 71 wells 2nd FLR 3	le pare Alun.	62"; 33 - 3	1'x62"; 22-3	<u>51"x54"                                   </u>
	- IMP. FAITA	VIPIN -				

PAGE ___ of

**** FMEA SIMILAR BUILDINGS SURVEY FORM ****
JENERAL BUILDING DATA  (S)  Entire Pldy is Vacant.  (ATN)
BLDG #:6252 BLDG NAME: HOSA CLINIC DATE: 2 15-88 JOB #: 124  SURVEYED BY: AM WW BLDG CONTACT: TELEPHONE EXT:  BLDG USE: HOSA WARD # FLOORS: 2 # PEOPLE: BLDG AREA: 21381 SF
BLDG OCCUPANCY: SMTWThFS 0730 TO 1640 SMTWThFS TO
T'STAT SETTING: HTG: 74/ AUTO SETBACK: N / Y:/_
Temperature, Future, inside, Occupied: 70/78 Temperature, Future, inside, Unoccupied: 55/- AirChange/hR: .57
ARCHITECTURAL AREA U-value UA
WALL 9,851 .229 2,256 GLASS 2,366 1.176 3,782
ROOF 9320 -074 690 FLOOR 9360 41 3821
SUM 36,857 - 9,549
Avg. Floor-Ceiling Height: 98 Floor type: C.S. Insulated: Y/N ndow frame type: Alum Wood Operable sections: 0/N ndow size: See Bolow SP DP CURT Infiltration L.M.H. # Entry doors: 6 # OH Doors: Ø % of Area Conditioned:
LIGHTING: Type:FLUORESCENT Watts/SF: 43 Util Frac:
ELECTRICAL EQUIP:OFFICE KW/Unit: #Units: Util Frac:
DHW: TYPE: NG/ELEC/CONV Supply Temp: GAL/Person-Day: AFUE: %
MECHANICAL HEATING COOLING
Primary System: HTHW > STM CONU NONE  Fùel: NAG(CP)  Capacity: 68.96%  Months ON: 8
Hours ON:  S808  Hp:  Cfm:  Min OA:  Economizer:
MISC:
WINDOWS: 20-31"X54"; 96-40"X62";
New Windows
Blugges locked up; - represents that radiating are controlled by many vilves.

PAGE

of.

•	***	FMEA SIMIL	AR BUILDIN	GS SURVEY FO	ORM *	***	
NER	AL BUILDI	NG DATA	3ldy is Va	raal	<u> </u>	(A5M	
CHRVE	VED RY AL	BLUG NAME	NIACI: ROVE	DATE: 2 -h. Henth TE PEOPLE: E	-15-85 10 LEPHONE E BLDG AREA:	XT: 5/37/5	-738 F
BLDG	OCCUPANCY	SMTW	Th F S Th F S	0730 TO 10	<u>• 40</u>		
T'STA	T SETTING	: HTG: 741 CLG: -/		AUTO SETBACK	<: (N) / Y:	/_	<del></del> ;
Tempe Tempe	rature,Fu rature,Fu	ture, inside ture, inside	Occupied:		Temp Pre AirChang	sent: 74 je/hR: .5	
ARCHI	TECTURAL		AREA	U-value		UA —	7 t = 1.2 t
	·		9.851	.229	2,25	6	-
		ROOF	z; 366 93 20		2,78	0	<del>-</del>
		FLOOR 3	93 <u>20</u> 6.857	4]	382 9.54		<del>-</del>
Ava.	Floor-Cei	lina Height	. 9.8 F1	oor type: C.	S. Insul	ated: Y/	Ø
indo	w frame t	ype: Alum	Wood	oor type: <u>C.</u> Operable sec CURT	tions: (1) Infiltrati	/ N	។ <b>អ</b>
$\pi$ Ent	ow size: _ try doors:	<u>Soe Below</u> 5 # OH	Doors: Ø	% of Ar	ea Conditi		<del></del> ·
LIGHT	TING: Type	:FLUORESCE	NT	الم Watts/SF	3 Util	Frac:	<del></del>
ELECT	TRICAL EQU	IP:OFFICE	KW/Unit:	#Units:	Util	Frac:	·
DHW:	TYPE: NG/	ELEC/CONV	Supply T AFUE:	•	GAL/Persor	n-Day:	_
MECHA	ANICAL	•	HEAT	ING	COOLI	ING	11, 11, 24
	Primary S	ystem:	まること	STM SOU	- NO		-
	Fuel: Capacity:		<u> </u>	(4)			<del>-</del>
	est.Peak	Del.Effic:	68.86 %			7. 🕻	
	Months ON Hours ON:		<u>5</u>	<del></del> -			¥1
AHUs	Hp:_					€ 14 A	all the
	cfm: Min						
		omizer:				P	_
MISC:					\$ #.	يو آف	
MISC.		IDOWS: 3	20 - 31"X	54": 96"-	- 40"x62	2";	_102IM
		3	36 - 31"X	62 1			<del>-</del>
	No Radio	whoms - Double P	ane blda	- one for Ed w	ine (N)/C)		<b>-</b>
				Me heating is on			<del></del>
		•		<u> </u>	<u>.</u>		_

		****	:	MEA ^M ŜÎMI	LAR BUI	LDINGS	SURVEY	FORM	***	*
Ţ		AL BUI	<u> </u>						/	(10/92) AJN
•	SHRVE	YFD RY	-116	DG-NAME: W-BLDG	CONTACT			IELEPH	UNE EXI	:
	BLDG	OCCUPA	NCY:	S M T W	Th F	<u> </u>	30 TO TO	1640		
	T'S <u>TA</u>	T_SETT	ING:	HTG: 74	/ - 0°	TUA AUT	O SETB			-1
	Tempe Tempe	<u>ra</u> ture <u>ra</u> ture	,Futu ,Futu	re,insid re,insid	e,Occup e,Unocc	oied: <u>70/</u> cupied: <u>&lt;</u>	78 55/-		p Prese Change/	
	ARCHI	TECTUR	3		ARE		U-val	ue	. UA	
			R	LASS	9,857 2,366 9320 9320		.229 1.176 .074		2,256 2,782 690 3971	
				<u> </u>	30,857				9,549	
	i ndo	w tran	IA TUT	hg Heigh e: الفقائم وفي الإمالة المالة المالة المالة المالة المالة المالة المالة المالة المالة المالة المالة المالة المالة المالة	เกา พกกถ	i une	erable	section	is: U/	N
	LIGHT	ING:	ype:F	LUORESCI	eur 😅	- d Wat	tts/SF:	<u>.43</u>	Util Fr	ac:
	ELECŢ	RICAL	EQUIP	OFFICE	*kW/Uni	i <b>t:</b> ::	#Unit	s:	Util Fr	ac:
	• •		NG/EL	EC/CONV		oly Temp		GAL/F	erson-D	ay:
		NICAL		· •		HEATING			COOLING	
	•	Primar Fuel: Capaci		tem:		G CCP	Conu		<del></del>	6
	<del></del>	est.Pe	ak De	].Effic:		36 %				
		Hours				300				
		1	fm: Min 0/ conor	l:						
	MISC:			orkie 4		יה ביינים	1 ^H 1 0.	1 11.4.	62"	
	-		LIND		70 - 36 - 3	31" x <b>5</b> 5	2 40	, - 40"		
·	、/ . -	Lare	LR N i	S Z-ANUS S Utility Sh	пр-вреп	m-FO			people.	
	-	Kest	of Bldg	is used as	storage	. (Vacunt)				

***	FMEA SIMILA	R BUILDINGS	SURVEY FO	RManig *	***	<u>~</u>
NERAL BUILDI	NG DATA	CARL DECIMENT OF		747 87	( 10/92 ( LON)	5
BLDG #:6255 SURVEYED BY:AM BLDG USE:HOSP	ALCIE BLDG CO	NTACT:	· TE	LEPHONE E	B #:124 XT:	) 
BLDG OCCUPANCY	: SMTWT SMTWT	h F S OT	730 -T0 <u>[(</u> T0 ,	<u> </u>	₹ 10% k	
T'STAT SETTING		AU	TO SETBACK	(: 10-1 Y;	<u> </u>	٠. ٢
Temperature,Fu Temperature,Fu	<pre>ture,inside, ture,inside,</pre>	Occupied: 70 Unoccupied:	/78 55/-	Temp Pre AirChang	sent: <u>Arc</u> je/hR:/570	۲ ; ^۳ پ څ څ ټ
ARCHITECTURAL					100	<u> ARC</u>
•	WALL	AREA 9.851	U-value 229	.2, 25	UA 56	
		2, 366	1.176	2,78 64		
	ROOF C	1320 1320	.074 .41	386		
	SUM3c	9,857		7,54	19	
Avg. Floor-Cei Window frame t indow size: Entry doors:	ype: Alum Se Below	Wood Op SP DP CU	erable sec RT	itions:(V) Infiltrati	ated: YMN /- N on LMM H oned:	
LIGHTING: Type	:FLUORESCEN	ST Wa	tts/SF: <u>.</u> 4	<u>3</u> Util	Frac:	:::1
ELECTRICAL EQU	IP:OFFICE K	W/Unit:	#Units:_		Fraca	PUB
DHW: TYPE: NG/	ELEC/CONV	Supply Tem AFUE:	p: (	GAL/Persor	n-Day; <u>4</u>	( 1 th a )
MECHANICAL			_~,·	COOLI	NC - 2/2	
Primary S	ystem:	HEATIN HTHW + STW		No		
Fuel:		NECCE	)		**************************************	
Capacity: est.Peak	Del.Effic:	68.96 %	<del></del>		<u> </u>	
Months ON	:	8				
Hours ON: AHUs Hp:		<u> 5808</u>			<u></u>	. JHA
cfm:					77.	
Min					6 TN.	
ECON	omizer:	· management of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of the second of		7.5	201	
MISC:		2///	u . 9/	40"x 62		72 IM
WIN	IDOWS: 2	<u>0 - 31" X54</u> 4 - 31" X62	16- Now		ouble pane	
2rd FLR			FIR South is	Occupational	Health	
_ MU por		1 A line	bond Heath 4	Kity heited by	radiators.	
_all_have	z & Named Construction		0 to 1630			

المراجع المعتبين

	GENERAL BUILDING DATA ZONE 1 23/19/93 DM
	#:8000 BLDG NAME: ONS FIELD MICE SHOP JOB #: 124 EYED BY: TEAM! DATE: 10/15/84 BLDG CONTACT: AL OHUS CONTACT TELEPHONE NUMBER: 419/3598 BLDG USAGE: REPAIR FACILITY TOT BLDG AREA: 96895 SF # OF FLOORS: L # OF PEOPLE: 110
	BUILDING OCCUPANCY: MON - FRI: 0700 TO 1000 FIRST SHIFT: SATURDAY: 0700 TO 1200 SECND SHIFT: SUNDAY: TO THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
4	HEATING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  PRESENT T'STAT: SE LUIS ON 3AM/OFF 330PM  REQUIRED T'STAT: 55E  THERMOSTAT LOCATION(S):  HUMIDIFICATION REQUIREMENTS (RH): H'STAT LOCATION(S):
	LIGHTING:  AREA(SF) LAMF TYPE #LMPS W/SF SCHEDULE  1) 96,895 FL/MV(139,780W) 126 L44 ON 0700 OFF 1600  ON OFF  ON OFF  ON OFF  ON OFF  ATTACHED SCHEDULE? V N
	ELECTRIC EQUIPMENT:  AREA (SF) TYPE (KW) W/SF SCHEDULE  1) SOURCE: CONSERVATION ASHRAE OTHER  SEE ATTACHED SCHEDULE? Y N
	INTERNAL MASS: MATERIAL: ESTIMATED MASS: _ (L, M, H)
	INFILTRATION: LOCATION(S): DVERHEAD DOORS - ~ 75 OPENINGS/DAY
	ESTIMATED RATE:(L, M, H) orCFM/LIN FT CRACK
	XIOOGRA UNIT
	* * IOOO% OA UNIT

Bldg No .: 8000 70NE ]

Page 1 of 41

ENERAL_	<u>BU</u>	<u> [TDING [</u>	<u>ATA</u>										
TRUC									, 1 <del>-1-</del>	GRO		U-VA	
•	N:	CONSTRUC	L PUL	/CMU		327		40-	5	13,2	25	02	
	E:	MAINSC B"CONG INS MI	. FIRE	ساحلما		296	-0"	31-1	<u> </u>	12/3	68	Ø. J.	9
ROOFS:	,		יד ד רואו	COMPONE	NIT.	WIDT	 -	HEIG	=- HT	AREA	(SF)	U-VA	LUE
.,	-	MTL DEC	K/Z*R	14.145/B1	U.R.	296	<u>-</u> 2"	327	<u>@"</u> 	96 ₁	79Z_	<i>Ø</i> , (	2 
	٠.												
	<b>L</b> I.	AREA (SF	Λ1	2/4 000	1/=	VED	CE.	✓ n	p V	DEAP	rs V		
	S:	1290		CH. PRO	IZEI	XED	SF SP	<u> </u>		DRAF	ES -		
										•			
		EA: 90,7		CRA	WL S	6P'ACE	<del></del>	_ BAS	EMENT	<b></b>	OTHE:	<b>∺</b> ∦	
PERIM	ETE	er: <u>95</u> 0	2LF	INSULAT	IONS	· <u>/</u>	_Y	_n <u>7</u>	_IN	<u>R1611</u>	2.10.7	74"	•
CIAL	ARE	EAS:								. <del></del>			
,iTION	IAL	NOTES:										· 	
												<u> </u>	
											<b></b>		
 TILM #:		 cp:/								·			
SKETCHES			er then TT #						<del></del>			<del></del>	
~ r - 1 i - Hr '~	· =												

Spacety an "Additional Notes"

Bldg No.: 8000 ZONE L

Page Zof4L

## GENERAL BUILDING DATA

MISCELLANEOUS BASE LOADS:  DOMESTIC HOT WATER:  MANUFACTURER * MODEL NONE  FUEL SOURCE NAT GAS ELEC OIL STM GEN OTHER*  SUPPLY TEMPERATURE F, DISTANCE FROM HEATER FT  INPUT RECOVERY RATE OPERATING SCHEDULE
TYPE NO 12 SCHEDULE CONTROL PHOTOCELL TYPE NO SCHEDULE CONTROL CONTROL TOTAL KW NO SECURITY FARKING LOT ENTRY OTHER*
ADDITIONAL COMMENTS: ONLY 30% OF OUTSIDE LIGHTS ARE ALLOWED
TO BE ON AT ANY TIME ( DURING THE NIGHT)
FILM #: FRAME #:

* Specify in "Additional Comments"

Bldg No.: 8000 ZONEL

Fage 3 of 41

НТ	ING S											Pag	je	of
AREA:	(A) (A)	AIN <u></u>	<b>X</b>	295 X	5_	SF		(	B)	ΞZ	zsF	:	•	
DATA	SOURO	CE:_K	_DF	AWING	55	_V_SI	JR'	VEY	TOUF	₹				
Mark	; #1a	wps	: u	//Fix	1,	#Fix	!	Flr	# ;	1	Comments	;		
E.	1 2	 		45	- T	408		A						
	2	<b></b> -	! 	75		13		A		: 				
	1 3		<u> </u>	12.5	 	6	: 	A		¦ 				
·	4		<u> </u>	50		101	· !	A		 				
	1 2		! 	12	:	5	:	<u>k</u>			EXIT LIGHTS			·
MV_	لـــــــــــــــــــــــــــــــــــــ										EXTERIOR			
	<u>'</u> <u></u>		<u>ا</u>	100	:	22	!	A	; 		HI-BAY		· 	
<del>ب</del>	لـــــــــــــــــــــــــــــــــــــ		اا	00		22_	: 	A			UTILITY TUNUEL	·		.: 
	!		: 		:		:							
	! 		: 		: 	·	:							
	: 		: 						; 					
	! 		: 		: 		: 		: 			<u></u> -		
	: 		: 					. سه هبه جبه هد						
	: 		: 		:		:							
	: 	. <del></del>	: 		; 				: 					
(A) TO	TAL:	139	7.78	30		Watt	5,	/	96	24	895sf=1.4	43	W/SF	
(B) TO	TAL:				<b></b> -	Watt	s	/			SF=		W/SF	
TIDDE	IONAL	. NOT	EŠ:											

## MECHANICAL_EQUIPMENT_DATA

Bldg No.: BOOD FONEL

AIR HANDLING UNITS:  MANUFACTURER HASTINGS MODEL NO. MUIZOOFR  AHU NUMBER: RTV-1 PAHU TYPE: ROOF MID MUA, VENTED  LOCATION: AREAL ROOF SPACE SERVED: RM 1-22	
FAN DATA:  SUPPLY FAN HP: 7.5 SUPPLY CFM: 12K STATIC PRESS: 1.25  RETURN FAN HP: - RETURN CFM: - STATIC PRESS: -  EXHAUST FAN HP: - EXHAUST CFM: - STATIC PRESS: -  MOTOR STARTER: MNT MOM . SWITCH: P.B. H.O.A. DISCON	
COILS:  HEATING: HW _ STM _ DIRECT FIRED> NG V DIL _ ELC_ OTHER  NO COOLING: CW _ DX FROM CHILLER , FROM DX UNIT  LO REHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE _  NO HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY _ , 3	
DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING \( \infty \) TO \( \infty \)  R.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING% TO  E.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING% TO  ECONOMIZER: Y (Y, N), IF YES, OA RA ENTHALPY  OA LEAKAGE: \( \frac{1}{20} \) Y IF NO, CAN ECONOMIZER BE ADDED \( \frac{1}{20} \)	0% % -%
FILTER CONDITION:GOODFAIRPOOR NONE	
*PRESENT OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: MON - FRI SAT SUN TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO	
HEATING SETPOINTS COOLING SETPOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGH  *PFESENT TEMP: 65 OFF	3
*PRESENT TEMP: 60 OFF  *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:	
*REQUIRED TMP:	
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:  SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F	
*REGUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:  SYSTEM SETPOINTS: MIXED AIR 'F. HOT DECK 'F. COLD DECK 'F TIME CLOCK: Y (Y, N), IF YES, IS IT OPERATIONAL Y (Y, N)  CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC  EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(P) T'STAT G H'STAT COMPR DAMPERS P LINKAGES G FANS G SHEAVES G VALVES E ACTUATORS G BELTS G MIXING BOX G OTHER	
*REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:  SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)  CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC  EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(P) T'STAT H'STAT COMPR DAMPERS _P LINKAGES _G FANS _G SHEAVES _G VALVES ACTUATORS _G BELTS _G MIXING_BOX _G	

Page 5 of 91

MECHANICAL_EQUIPMENT_DATA
AIR HANDLING UNITS:  MANUFACTURER HASTILIGS MODEL NO. LBILB  AHU NUMBER: RTIA-FAHU TYFE: MUA, 100% O.A.  LOCATION: SFACE SERVED:
FAN DATA:  SUFFLY FAN HF: 10 SUFFLY CFM: 15K STATIC FRESS: 1.25  RETURN FAN HF: - RETURN CFM: - STATIC FRESS: -  EXHAUST FAN HF: - EXHAUST CFM: - STATIC FRESS: -  MCTOF: STARTER: MNT _ MOM SWITCH: F.B H.O.A DISCON
COILS:  HEATING: HW _ STM _ DIRECT FIRED> NG / G1L _ ELC_ GTHER
DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING Q% TO Q% R.A. DAMPER: H (Y, N), IF YES, FIXED%, MODULATING% TO% E.A. DAMPER: H (Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER: L (Y, N), IF YES, OA RA ENTHALPY OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GODDFAIRPOOR WONE
SYSTEM OPERATION: MON - FRI SAT SUN  *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
*FRESENT TEMP:
SYSTEM SETPOINTS: MIXED AIR'F, HOT DECK'F, COLD DECK'F TIME CLOCK: $Y$ (Y, N), IF YES, IS IT OPERATIONAL $Y$ (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, FNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F) T'STAT COMPR DAMPERS LINKAGES FANS SHEAVES VALVES ACTUATORS BELTS MIXING BOX OTHER
COMMENTS: THIS ISTYPICAL OF SIX (6) UNITS - RTL-A THRUE.
LUUT HAS BEEN CONVERTED TO 100% RA.
> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8200 ZOLLE L

Page bof41

MECHANICAL_EQUIEMENT_DATA
AIR HANDLING UNITS:  MANUFACTURER HASTINGS  AHU NUMBER: RT-2 AHU TYFE: MUA 100% O.A.  LOCATION: ROOF  SPACE SERVED: AREA I
FAN DATA:  SUPPLY FAN HP: 7.5 SUPPLY CFM: 12K STATIC PRESS: 1.25  HD RETURN FAN HP: RETURN CFM: STATIC PRESS:  HD EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS:  MOTOR STARTER: MNT MOM SWITCH: F.B H.O.A. V DISCON
COILS:  HEATING: HW _ STM _ DIRECT FIRED> NG _ O:L _ ELC _ OTHER _  NO COOLING: CW _ DX FROM CHILLER FROM DX UNIT  NO REHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE  NO HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY 3 WAY
DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING Ø% TO Ø%  R.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING% TO%  E.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING% TO%  ECONOMIZER: Y (Y, N), IF YES, OA RA ENTHALPY  OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRPOOR NONE
SYSTEM OPERATION: MON - FRI SAT SUN  *FRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO TO
<u>HEATING SETFOINTS COOLING SETFOINTS</u> WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
*FRESENT TEMP: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) T'STAT A H'STAT COMPR DAMPERS D LINKAGES A FANS A SHEAVES A VALVES A ACTUATORS A BELTS A MIXING BOX A OTHER
COMMENTS:
> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8000 ZOUE L

Harris Commence Control of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the Commence of the

Page 7 of 41

	MECHANICAL_EQUIPMENT_DATA
	AIR HANDLING UNITS:  MANUFACTURER HASTINGS  AHU NUMBER: RT3A+C AHU TYPE: MUA, 100% OA  LOCATION: ROOF  SPACE SERVED: AREAS 183
ļ	FAN DATA:  SUPPLY FAN HP: 10 SUPPLY CFM: 15K STATIC PRESS: 125  NORETURN FAN HP: - RETURN CFM: - STATIC PRESS: - STATIC PRESS: - DISCON DISCON DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISCON - DISC
	COILS:  HEATING: HW _ STM _ DIRECT FIRED> NG / G!L _ ELC OTHER NO COOLING: CW _ DX FROM CHILLER FROM DX UNIT NO REHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE NO HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY _ , 3 WAY
	DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING% TO DO%  R.A. DAMPER: N (Y, N), IF YES, FIXED%, MODULATING% TO%  E.A. DAMPER: N (Y, N), IF YES, FIXED%, MODULATING% TO%  ECONOMIZER: N (Y, N), IF YES, OARAENTHALPY  OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
	FILTER CONDITION:GOODFAIRFOOR NONE
	SYSTEM OPERATION: MON - FRI SAT SUN  *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
	<u>HEATING SETPOINTS COOLING SETPOINTS</u> WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
	DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP:
	DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP:
	DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *PRESENT TEMP:
	*PRESENT TEMP:  *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH):  SYSTEM SETPOINTS: MIXED AIR TIME CLOCK:  (Y, N). IF YES, IS IT OPERATIONAL  (Y, N)  CONTROLS: PNEUMATIC  EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F)  H'STAT — COMPR — DAMPERS P LINKAGES G FANS G SHEAVES OTHER  OTHER
	*PRESENT TEMP:  ***********************************
	*PRESENT TEMP:  *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH):  SYSTEM SETPOINTS: MIXED AIR TIME CLOCK:  (Y, N). IF YES, IS IT OPERATIONAL  (Y, N)  CONTROLS: PNEUMATIC  EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F)  H'STAT — COMPR — DAMPERS P LINKAGES G FANS G SHEAVES OTHER  OTHER
	*PRESENT TEMP:  *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH):  SYSTEM SETPOINTS: MIXED AIR TIME CLOCK:  (Y, N). IF YES, IS IT OPERATIONAL  (Y, N)  CONTROLS: PNEUMATIC  EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F)  H'STAT — COMPR — DAMPERS P LINKAGES G FANS G SHEAVES OTHER  OTHER

Bldg No.: 8000 FONE

Page 8 of 41

MECHANICAL EQUIPMENT DATA
AIR HANDLING UNITS:  MANUFACTURER HASTINGS MODEL No. LB 28A  AHU NUMBER: RT4A, BAHU TYFE: MUA, 100% O.A.  LOCATION: ROOF SPACE SERVED: ARFA 2
FAN DATA:  SUFFLY FAN HF:  NORETURN FAN HF:  RETURN CFM:  STATIC FRESS:  STATIC FRESS:  NO EXHAUST FAN HF:  EXHAUST CFM:  STATIC FRESS:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR STAFTER:  MOTOR
COILS:  HEATING: HW _ STM _ DIRECT FIRED> NG / G1L _ ELC_ OTHER _  NOCOOLING: CW _ DX FROM CHILLER FROM DX UNIT  NOREHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE  NO HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY _ , 3 WAY
DAMPERS:  O.A. DAMPER: Y (Y, N), IF YES, FIXED%, MODULATING% TO%  R.A. DAMPER: N (Y, N), IF YES, FIXED%, MODULATING% TO%  E.A. DAMPER: N (Y, N), IF YES, FIXED%, MODULATING% TO%  ECONOMIZER: N (Y, N), IF YES, OA RA ENTHALPY  OA LEAKAGE: 30% IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRFOOR_NONE
SYSTEM OPERATION: MON - FRI SAT SUN  *FRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETFOINTS  WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS  DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT  *FRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: $\Upsilon$ (Y, N), IF YES, IS IT OPERATIONAL $\Upsilon$ (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
H'STAT COMPR DAMPERS P LINKAGES G FANS G SHEAVES G VALVES G ACTUATORS G BELTS G MIXING BOX G
COMMENTS: THIS IS TYPICAL OF TWO (2) UNITS - RT4A &B.

Bldg No.: 8000 ZONE L

SA CARLOS CONTRACTOR OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SAME OF THE SA

Page 9 of 41

WECHONİCƏL	_EQUIPMENT_DATA			•	
HANDLI ONTROL	NG UNITS: STRATEGY: BLOWER:	-ON/OFF h	VPLATE!	BURNER,	
MODUL	ATING LEAVING AIR	T-STAT W/C	WER-RIDIN	14 ROOM T	-STAI
····					
	AHU/SYSTEM COMMENTS:				
	M AT OF 65° F.				
				· · · · · · · · · · · · · · · · · · ·	
			•	•	
1 to 4 of					
	FRAME #:	· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·	
SYSTEM SKET	ICH:			•	

Bldg No.: 8000 FONE 1

Page 100f41

	MECHANICA	L_EQUIPM	IENT_DATA		5	IMILAR UESS-T	ITY IMATION	:	
	EXHAUST F	ANS:			. Ot		•		(19-19)
	UNIT NO.	TYPE	AREA	ary	CFM	HF.	STARTER & CONTROL	SETFOINT	. 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to 10 to
	PRY 1-1	ROOF		<u>L</u>	1575	1/4	MAINTAINED		
	PRV_1-2			2	875	10	<u> </u>		
	EFIL				15K_	7.5			
	PRV1-3			_2	11,150	5.0	<u> </u>		
	PRV1-4	<u>k</u>			12K	5,0	<u> </u>		
	PRVL-5	t			1025	1/2	<u> </u>		
•	FRY1-6	h			15K_	7,5			•
	EEL-Z	CENT			4K	3/4	10		·
	EE1-3_				4K_	3/4			
	PRV2-1	ROOF		2	JOK	5,0		• .	•
	PRY 2:2			<u></u>	825	<u>1/10</u>	`		
	EFZ-L	CENT_	2		52K	1.0			.*
	PRV3-1_	ROOF	3	3	825	1/10	<u> </u>		
	PRV3-2		3		15K	7,5	<u> </u>		
	EF1-4	<u> </u>			12,750	5.0			
	EEZ-Z	k			3,200		<u> </u>		
	EF 2:3	k			1,200	1/2			
	PRV3-3		3		10,000			,	
	Zo	ne 1 A	HHUs	Mr. of J	<u> </u> Υ	- 0.5da	iys X AHU AHU Trong = 1663	7=-5461	O H
	Ars 4	Oper./ye	ar: 65	11 Hay Dey	recdays )	K 2.	AHU AND	N 24	70 Hg.
	FILM #:		FRAME #:	JOT. HES	operation=	1663 t	- 2466 = 41	30 (FRS.	

NOTES: TYPE --> propeller, centrifugal, etc.

STARTER & CONTROL --> momentary, maintained, line v stat,

24 v stat. self contained, etc.

Bldg No.: 8000 FOLE

Page 11 of41

HANDLING UNITS:	ON/OFF W/PLATE BURNER,
ONTROL STRATEGY: BLOWER -	ON/OFF W/ PLATE BURNER,
MODULATING LEAVING AIR	T-STAT W/OVER-RIDING ROOM T-STAT
	· 
ADDITIONAL AHU/SYSTEM COMMENTS:	ALL AIR-HANDLERS EFFECT A
MAXIMUM AT OF 65°F.	ين جيد جي جي جي جي جي جي جي جي جي جي جي جي جي
•	
	·
The world	
FILM #: FRAME #:	
SVSTEM SKETCH.	

Page 10of41

MECHANICAL_EQUIPMENT_DATA

GENERAL BUILDING DATA ZONE 2 3/19/93 OM
#: 8000 BLDG NAME: CONS FIELD MICE SHOP JOB #: 174 EYED BY: TEAM L DATE: +0/15/84 BLDG CONTACT: AL JOHNS CONTACT TELEPHONE NUMBER: 3548/419 BLDG USAGE: OFFICES TOT BLDG AREA: 24,330 SF # OF FLOORS: # OF PEOPLE:
BUILDING OCCUPANCY: MON - FRI: 0700 TO 1600 FIRST SHIFT: SATURDAY: TO TO SECND SHIFT: SUNDAY: TO TO THIRD SHIFT: HOLIDAYS: HOLIDAYS:
ENVIRONMENTAL CONDITIONS:
HEATING SETEDINTS  WEEKDAYS  WEEKDAYS  DAY  NIGHT  DAY  NIGHT  PRESENT T'STAT:  THERMOSTAT LOCATION(S):  HUMIDIFICATION REQUIREMENTS (RH):  HEATING SETECINTS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  WEEKENDS  HISHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIGHT  DAY  NIG
LIGHTING:  AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE  1) Z4,230 FL (34 W+3 ½ WB) 725 112 ON 0700 OFF 600  2) (2x6W+2WB) 12 ON 0FF  ON 0FF  SOURCE: LOBSERVATION ASHRAE OTHER  ATTACHED SCHEDULE? LY N
ELECTRIC EQUIPMENT:  AREA (SF) TYPE  1) 24,330 GEN OFC EQUIP  2) ON OFF  ON OFF  DATA SOURCE: OBSERVATION LASHRAE OTHER  SEE ATTACHED SCHEDULE? Y N
INTERNAL MASS: MATERIAL: <u>JUTERNAL PARTY</u> ESTIMATED MASS: L (L, M, H) INFILTRATION: LOCATION(S): <u>KINDOWS, OA DAMPERS</u>
ESTIMATED RATE: 25 (L, M, H) orAIR CHANGES orCFM/LIN FT CRACK

#### *** FMEA_SURVEY_OBSERVATIONS__***

GENERAL BUILDING DATA

CONCEDUCTION.		•		
CONSTRUCTION: WALLS: CONSTRUCTION COMPONEN	T WIDTH	HEIGHT	AREA(SF)	U-VALUE
n: — s: <u>Tusul. MTL PNL</u>		9-5%	948	
E: TUSUL MTL PNL	<u> </u>	7-02"	1914	0.19
ROOFS: CONSTRUCTION COMPONEN B.U.R./2 RIGINS/SIL	DK 243-4"	HEIGHT	AREA (SF)	U-VALUE
WINDOWS: AREA(SF) TYPE .	Q.D.	- ne -	DEARES -	•
s: 352 ARCH PRO	2), SF SF SF	DP W	DRAPES A	Minde
FLOOR TYPE: SLAB CRAW AREA:SF	L SPACE	_ BASEMEN	T VOTHE	EF:*
PERIMETER:LF INSULATI	ON?Y_	NIN		
SPECIAL AREAS:				
ADDITIONAL NOTES: FLOOR 15.1	N ZUP STO	RY SPAC	E	
			~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
	كالمقد كنيت منيت منيت فينه فيدن ويبيد منيت فيدن ويت			
FILM #:FRAME #:				
SKETCHES:				

* Specify in "Additional Notes"

Bldg No.: 8000 ZOUEZ

Page 13 of 41

GENERAL BUILDING DATA	
ELLANEOUS BASE LOADS: ESTIC HOT WATER: MANUFACTURER & MODELUNKNOWN FUEL SOURCE NAT GAS ELEC OIL SUPPLY TEMPERATURE 120 'F, DISTANCE FROM HEA INPUT 440 b/hrecovery rate OPERATING	ATER 100 FT
TYPE MV NO SCHEDULE VARIES TYPE NO SCHEDULE TOTAL KW Q.4 FUNCTION OF LIGHTS SECURITY PARKING L OTHER*	
ADDITIONAL COMMENTS: STM GENERATOR SUPPL	IED BY BOILERS
IN SAME MER.	
	•
·	
·	
· · · · · · · · · · · · · · · · · · ·	
ADDITIONAL SKETCHES:	
HUDITIONAL SKEILMEST	

pecify in "Additional Comments"

Bldg No.: 8000 70NEZ

GENERAL BUILDING DATA

The state of the s

LIGH	I ING SC	HEDULE				·	, aðac+
AREA:	(A)MA (A)	IN 24,33	Øsf	(1	B)MEZZ B)	SF _X	
DATA	SOURCE	DRAWI	INGS KS	URVEY :	TOUR		
Mark	: #lam	ps W/Fi	× #Fix	Flr	# {	Comments	
上	1 3	109	19	'A	!		
	1 2		1234	' A	!		· ·
:	6		1 33	<u> </u>	!		
	<u>-</u>	<u>'4L</u>	- ' 2	<u> </u>			
		15					
MY		1 460		<u> </u>	'EXTE	RIOR	
*** *** *** **		!	!	!	: 		
	i						
		! 		! 			
	<u> </u>			: 			
	: 	! 		! 			
	; 	<u>-</u>	: 	·	·		
	i 	i 		: 			
	i 	i 	i 	; - -			
	· 	i 	; 				
(A) TO	TAL:	27,216	Watt	s/_ Z	4,330	sf=l.12_	W/SF
(B) TO	TAL:		Watt	5/		SF=	W/SF
	IONAL N			.1 .11			·
AHU1	i ea di emp. risc	umper has	its own con	o.A.&E	xh.A. Close,	4 R.A. opers.	
\$ 0A	proside is	true		1 .		EMES TO CONTING O	unaits
0.A.	dayer co	entral setat	<i>-30°F</i> 50°F	via o	.A. temp. co	ntrol; & also to a	wtro (
Exh A.	k	1 1 4 h	70°F	Airc	condolioning.	are Honeywell "Mode	And .
	_	11 11 MM 7-11="	32	MU dam	for actuators.		
prad	NO.: DV	XXXX ZOUE				Page	150+41

MECHANICAL EQUIPMENT DATA

HANDLING UNITS: NUFACTURER UNKNOWN MODEL NO. AHU NUMBER: 21-1 AHU TYPE: VERTICAL FLOOR MOUNT LOCATION: ROOM 21-1 SPACE SERVED: AREA 22
FAN DATA: SUPPLY FAN HP: SUPPLY CFM: 20,995 STATIC PRESS: 0.5 RETURN FAN HP: RETURN CFM: STATIC PRESS: 0.25 ** EXHAUST FAN HP: SEXHAUST CFM: 8, 60 STATIC PRESS: 0.25 MOTOR STARTER: MNT MOM SWITCH: P.B. H.O.A. DISCON EF 21-1 INTERLOCKED COILS:
HEATING: HW STM / DIRECT FIRED> NG GIL ELC OTHER COOLING: CW DX / FROM CHILLER , FROM DX UNIT 7[-] NO REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE RECOUL: # OF COILS TYPE SWAY ELC HW/CW COIL VALVES: 2 WAY , 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED 0%, MODULATING 0% TO 00% R.A. DAMPER: Y (Y, N), IF YES, FIXED 5%, MODULATING 0% TO 00% E.A. DAMPER: Y (Y, N), IF YES, FIXED 5%, MODULATING -% TO -% E.A. DAMPER: Y (Y, N), IF YES, FIXED 5%, MODULATING -% TO -% E.A. DAMPER: Y (Y, N), IF YES, OA RA ENTHALPY OA LEAKAGE: 7 % IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRPOOR PERMANENT
*PRESENT OPERATION: CONTILUOUS SAT SUN *REQUIRED OPERATION: DESTROY TO SON TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: 10 F 70 F *REQUIRED TMP: USF 55 F NO HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 53°F, HOT DECK°F, COLD DECK°F TIME CLOCK: N (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC /, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) TOSTAT HOSTAT COMPR DAMPERS P LINKAGES P FANS G SHEAVES G VALVES P ACTUATORS G BELTS G MIXING BOX G OTHER
COMMENTS: * SEE EXHAUST FAN SCHEDULE-
XECONOMIZER SENSING BULBS PODELY LOCATED, CONTROL SCHEME
·

Bldg No.: 8000 FONE Z

en de la proposition de la company de la company de la company de la company de la company de la company de la

Page 16 of 41

DECURATOR TENDENT DE LA
AIR HANDLING UNITS: MANUFACTURER LINKUMUM AHU NUMBER: ZI-Z AHU TYFE: VERTICAL FLOOR MOUNT LOCATION: ROOM ZI-L SPACE SERVED: AREA Z-2
SUFFLY FAN HF: 712 SUPFLY CFM: 17230 STATIC FRESS: 0.6 RETURN FAN HF: 72 RETURN CFM: 5 STATIC FRESS: 0.2 EXHAUST FAN HF: 3 EXHAUST CFM: 16.260 STATIC FRESS: 0.2 MCTOR STARTER: MNT MOM SWITCH: F.B. H.O.A. DISCON LUTERLOCKED W/RFZI-Z COILS: HEATING: HW STM DIRECT FIRED -> NG GIL ELC OTHER COOLING: CW DX FROM CHILLER FROM DX UNIT NOREHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE NO HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY , 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING 0 % TO 1000% R.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING 0 % TO 1000% E.A. DAMPER: Y (Y, N), IF YES, FIXED 50%, MODULATING - % TO -% ECONOMIZER: Y (Y, N), IF YES, OA RA ENTHALPY OA LEAKAGE: 5 % IF NO. CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIR FOOR PERMANENT
SYSTEM OPERATION: MON - FRI SAT: SUN *FRESENT OPERATION: XX TO
HEATING SETPOINTS COOLING SETEOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 62 °F, HOT DECK°F, COLD DECK°F TIME CLOCK: N (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E). GOOD(G), POOR(F) T'STAT G. H'STAT COMPR DAMPERS P LINKAGES P FANS Q SHEAVES Q VALVES P ACTUATORS Q BELTS Q MIXING BOX Q OTHER
COMMENTS: X SEE NOTES, AHU ZI-L (Same setpts as AHU#1 except
XX SEE AHUZI-1 SCHED. S.A. set et at \$5°F.)
> Disregard if the item is the same as the GENERAL BUILDING DATA.
> Discedard it the item is the same as the service

Bldg No.: 8000 70NE 2

Page 17 of 41

MECHANICAL_EQUIEMENT_DATA
AIR HANDLING UNITS: MANUFACTURER LINKUOLIN MODEL NO. AHU NUMBER: Z-3 AHU TYFE: VERTICAL, FLOOR MOUNT LOCATION: ROOM ZI-L SPACE SERVED: AREA ZI
FAN DATA: SUFFLY FAN HF: 5 SUFFLY CFM: 12200 STATIC FRESS: 0.5 RETURN FAN HF: - RETURN CFM: - STATIC FRESS: - EXHAUST FAN HP: L EXHAUST CFM: 10.800 STATIC PRESS: 0.1 MCTOR STARTER: MNT _ MOM _ SWITCH: F.B H.O.A DISCON _ INTERLOCKED W/ PRVZI-Z,4,5 COILS:
HEATING: HW STM / DIRECT FIRED> NG 01L ELC OTHER
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING 0% TO 100% R.A. DAMPER: Y (Y, N), IF YES, FIXED -%, MODULATING 0% TO 100% E.A. DAMPER: Y (Y, N), IF YES, FIXED 50%, MODULATING -% TO -% ECONOMIZER: Y (Y, N), IF YES, OA FRA ENTHALPY OA LEAKAGE: 5 % IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRPOOR PERMANENT
•
SYSTEM OPERATION: MON - FRI SAT SUN **** *PRESENT OPERATION: TO
*REQUIRED OPERATION: TO
*REQUIRED OPERATION: TO
*REQUIRED OPERATION: TO
#REQUIRED OFERATION: TO
*REQUIRED OPERATION: TO TO TO TO HEATING SETPOINTS COOLING SETEDINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *FRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N) CONTROLS: PNEUMATIC , ELECTRIC , PNEUMATIC/ELEC EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT Q H'STAT COMPR DAMPERS _P LINKAGES _P FANS Q SHEAVES Q VALVES _P ACTUATORS _Q BELTS _Q MIXING BOX Q OTHER
*REQUIRED OPERATION:
*REQUIRED OPERATION: TO TO TO TO HEATING SETPOINTS COOLING SETEDINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *FRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N) CONTROLS: PNEUMATIC , ELECTRIC , PNEUMATIC/ELEC EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT Q H'STAT COMPR DAMPERS _P LINKAGES _P FANS Q SHEAVES Q VALVES _P ACTUATORS _Q BELTS _Q MIXING BOX Q OTHER

Fldg No.: 6000 FOLE Z

Page 18of41

MECHANICAL_EQUIPMENT_DATA

AIR HANDLING UNITS: CONTROL STRATEGY: MAX OV = 2400 FPM, MODULATING TEMP
CONTROLLER IN SA, FACE & BYPASS DAMPERS, LOW LIMIT STAT TO
SHUT-DOWN FAN & CLOSE OA DAMPERS.
ADDITIONAL AHU/SYSTEM COMMENTS: UNITS USED MAINLY FOR
VENTILATION. SA TEMP TEMPERED TO APPROX 70° F. OA. & RA
DAMPERS ARE MODULATED TO PROVIDE 70° F. SA.
BASEBOARD UNITS SUPPLY MOST HEATING IN THIS FONE.
THEY ARE NOT ON J-STATS, 55 OA TEMP SHUTS OFF BBUNUTS
MAINTENANCE PERSONNEL MANUALLY REGULATE WATER TEMP
TO KOO ABOVE 10°F; 175°F BELOW 10°F.
FILM #: FRAME #:
SYSTEM SKETCH:

Page 190AL

MECHANICAL_EQUIPMENT_DATA

ARY UNIT NO		EQUIPMENT: OUTPUT CAPACITY	HEATING SOURCE	CFM	HP	STARTER & CONTROL	SETPOINT
Z1-1A		25.2MB1	1_HW	4500	1/10	SELF-CONT	
21-18		1.		"		(,	+
21-1C		u	41		tı	q	k
21-10	şt .	(1	ч	·		H .	11

			· · · · · · · · · · · · · · · · · · ·				
	· •• •• •• •• •• •• ••				. -	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	
							·
			**		· · · · · · · · · · · · · · · · · · ·		
	. ويون مايند مايند ويون جينان باوي مينان الجالد و				·		
		unit heate					
		wall furna BOURCE> e	ce. etc.				,
		ŀ	not water,	etc.		d, line v s	tat,

· Takka kalifur · Takka kalifur a sa masa kalifur kalifur in taka kalifur kalifur kalifur kalifur kalifur kalifur

Bldg No.: <u>8000 ZONE</u> Z

Page 20 of 41

MECHANICAL_EQUIPMENT_DATA

UNITARY (COOLING E	COUIPMENT:				OT 45.755	
UNIT NO.	TYPE	CAFACITY		CFM		STARTER & CONTROL	SETFOINT
ACG-L*	_PKG_	42.7KBTU	ELEC	23K/4	~3/4	T-STAT_	73+2°F
						11	
							73°08/60°WB
<u> </u>							
* Id/All	2 (OO) 5	D COLIDE	 1165 D				and the state of t
,							
•	• •						
		•				FM.	
TOUR	y volum	IE-KEIUK	AN VICTURY	1E_LD_1	11-11-	<u> </u>	
							ι
						•	
FILM #:	F	FRAME #:					

water and the second of the second

Bldg No.: 8000 70NE 2

Page Zlof41

The Company of the Control of the Co

MECHANICAL_EQUIPMENT_DATA

JUST F	ANS:						
UNIT NO.	TYPE	AREA	USE	CFM	HF	STARTER & CONTROL	SETFOINT
REZI-L	IT CEN		RA/EA	18,16	27/2	ON/OFF/PL	INTERLOCK
PRVZI-I	ROOF	21	LLASS BOOM_	500	~1/10		
PRVZZ-1			JOILET				
PRV21-2		_2L	GEN EXH.	10.8K	~2_	11	SUMMER ONLY
PRVZ1-3		_2L	JOILET	400	~1/10		
* FRV21-4	11	_21	_DWLH000p_	400	-1/10		INTERLOCK
* FRY21.5		_21	GRIDDLEHOOD	1800	~/3_	<u> </u>	"
RF21-2	1:LCEI		RA/EA	16,260	~11/2	1	
PRVZL-6	ROOF	_ZL		800	1/10		
						,	
							70 50 din on our out out
							-
						·	
* PROBAB	LY HOT L	ISED-		يد وب جيء حت حت حت دت			** 440 and 100 and 440 and 440 and
				*	· — — — — —		
ن وي ويد بنب شب شب ملك شلك شده ملت							
					·		
	· · · · · · · · · · · · · · · · · · ·					· 	
FILM #:	F	RAME #: _					

NOTES: TYPE --> propeller, centrifugal, etc. STARTER & CONTROL --> momentary, maintained, line v stat, 24 v stat. self contained, etc.

Programme of the second

GENERAL BUILDING DATA ZONE 3
BLDG #: 8000 BLDG NAME: COUS FIELD MIKE SHOP JOB #: 124 SURVEYED BY: TEAML DATE: 10/15/84 BLDG CONTACT: AL JOHNS CONTACT TELEPHONE NUMBER: 3548/4119 BLDG USAGE: REPAIR FACILITY TOT BLDG AREA: 128,000 SF # OF FLOORS: 2 # OF PEOFLE: 55
BUILDING OCCUPANCY: MON - FRI: 0765 TO 600 FIRST SHIFT: SATURDAY: - TO - SECND SHIFT: SUNDAY: - TO - THIRD SHIFT: HOLIDAYS: - TO - HOLIDAYS:
ENVIRONMENTAL CONDITIONS:
HEATING SETPOINTS COOLING SETECINIS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: 70
LIGHTING: AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE 1) 120,000 FL 050 2.4 ON 0700 OFF 100 2) ON OFF 3) ON OFF 4) ON OFF DATA SOURCE: OBSERVATION ASHRAE OTHER SEE ATTACHED SCHEDULE? VY N
ELECTRIC EQUIPMENT: AREA (SF) TYPE (KW) W/SF SCHEDULE 1' 120,000 KSY: IT MEG 1920 15 ON 0700 OFF 1600 2) 3) 4) DATA SOURCE: OBSERVATION ASHRAE OTHER SEE ATTACHED SCHEDULE? Y N
INTERNAL MASS: MATERIAL: SIL/CONC/INVENTOR STIMATED MASS: H (L, M, H)
INFILTRATION: LOCATION(S): OH, BIFOLD ENTRY DOORS

ESTIMATED RATE: ___(L, M, H) or _____CFM/LIN FT CRACK

Page 23 of 41

<u>GENERAL_BUILDING_DATA</u>

STRUCT	ION:					
ALLS:	CONSTRUCT:	ION COMPONENT	WIDTH 358-0	HEIGHT 30:5"	AREA (SF)	U-VALUE
S	: 78% - "	/ 72% " / 21% "	358'-0" 385'-0"	23'-0" 23'-1" 24'-6"	8,749	Q.23 Q.22
W	85% "	/_15%	124-0	24-6"	3,037	Ø. ZI
ROOFS:	CONSTRUCT	ON COMPONENT	WIDTH 370-0	HEIGHT.	AREA (SF)	U-VALUE
			· · · · · · · · · · · · · · · · · · ·			
WINDOWS N S _ E	: AREA(SF) : 81.0 : 1219.0 : 344.0 : 24.0	TYPE ARCH PROJ "I FIXED	SP SF SP SP	DF // DP // DP //	DRAFES LA DRAFES LA DRAFES LA	
	Y PE: / SL REA: 115,400	AB CRAWL SF	SPACE	BASEMENT	OTHE	R*
PERIME	TER: 1,235_	LF INSULATION	? <u></u>	_N ZIN	RIG TO 2	3 <u>"</u> _
SPECIAL A	REAS:					
ANOITI	L NOTES:					
		· · · · · · · · · · · · · · · · · · ·				
*IMP=	Insulated	METAL PANEL	/OHD=	OVER-HEA	DOOR	
FILM #:	FRAME	#:				
SKETCHES.						

becify in "Additional Notes"

Bldg No.: 800 ZONE 3

*** FMEA_SURVEY_OBSERVATIONS__***

SUPPLY TEMPERA	ER: MODEL SE _ NAT GAS _ TURE	F. DISTANCE	OIL ST FROM HEATE	M GENOTHER* RFT HEDULE
EXTERIOR LIGHTIN TYPE _MV TYPE TOTAL KW _8.1 FUNCTION OF LI	NO <u></u>	CURITY	PARKING LOT	CONTROL HODGELL CONTROLENTRY
ADDITIONAL COMME				
		i di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di k Kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacamatan di kacama		
FILM #: F	 RAME #:			

* Specify in "Additional Comments"

Bldg No.: 8000 FONE 3

ADDITIONAL SKETCHES:

GENERAL BUILDING DATA

Fage 250f41

G	Ē	N	Ę	R	Α	L	B	U	I	L	D	Ι	N	6	D	Α	T	A	

()	rin	16 SCH	EDU	LE					•					P	age,		_of_		4
ARÉA:	: ((A) MAI (A)	и <u>Т</u> 2	B,000	D _	SF		() ()	B) M B) _	EZZ_	X		5	F					
DATA	SC	OURCE:		DE:AWIN	169	SI	JR'	VEY	TOU	R	•								
Mark	1	#lamp	s :	W/Fix	;	#Fix	{	Flr	#	! .		Co	ກທອດ	ts					
F	T -	2_		23ø	!	525	T	A		8	'NA:	πМ	SER		E	 څد		-	
	!	4_		143_		46	:	A		4'								****	
	!	2		75_	; 	494	!	A		4		#							
	!	2			- !	21	!	A		EX	4 <u>7 l</u>	J4H:	[5						
				15										kl/	مالا	MP		ABLE	シワ
				100															:
K.Y	!	<u></u>	1	400	;	19	;	A		EX	TERK	08							
	¦ 																		
,	¦ 		:		!		:						. — — —	· ••• ••• ••• ••				_	4
	! 		¦ 		: 		:		; 									_	
	: 		!		:		:				, 		· · 		•			_	
	! 		-:		!		!	<u>:</u>	!					·				-	
	; 		<u> </u>		:	-	! 				·							-	
	!	•	i		:		!		:			•							
	!				ī				<u>-</u>										
(A) TOT	ΓAL	. <u>k</u>	ÐØ,	679		_Watt	5/	129	3,Q	XXX		SF	=	19 _	_ W	/SF		-	
ADDITI																	•		

Bldg No.:____

Page 26 of 41

MECHANICAL EQUIPMENT DATA

Bldg No.: 8000 70NE3

AIR HANDLING UNITS: MANUFACTURER UNKNOWN MODEL NO. AHU NUMBER: 4-14/B AHU TYPE: HORIZONTAL, CELLING MOUNT LOCATION: AREA 4 SPACE SERVED: AREA 4
FAN DATA: SUPPLY FAN HP: ~ SUPPLY CFM: 4050 STATIC PRESS:0.35 RETURN FAN HP: — RETURN CFM: — STATIC PRESS: — EXHAUST FAN HP: ** EXHAUST CFM: STATIC PRESS: — MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A DISCON INTERLOCKED W/ PRVA-L : 4-2 COILS:
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED Ø%, MODULATING -% TO -% R.A. DAMPER: Y (Y, N), IF YES, FIXED Ø%, MODULATING -% TO -% E.A. DAMPER: H (Y, N), IF YES, FIXED -%, MODULATING -% TO -% ECONOMIZER: N (Y, N), IF YES, OA RA ENTHALPY OA LEAKAGE: Ø % IF NO, CAN ECONOMIZER BE ADDED _ Y
FILTER CONDITION:GOODFAIRPOOR UNK
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *FFESENT TEMP: 66 66
SYSTEM SETPOINTS: MIXED AIR (3) F, HOT DECK F, COLD DECK F TIME CLOCK: (4) (Y, N), IF YES, IS IT OPERATIONAL (4) (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E). GOOD(G), FOOR(F) T'STAT H'STAT COMPR DAMPERS _P_ LINKAGES _P_ FANS G_ SHEAVES G_ VALVES P_ ACTUATORS G_ BELTS G_ MIXING BOX G_ OTHER
COMMENTS: UNIT DESIGNED FOR 100% OA OPERATION. INTAKE HAS
BEEN BLOCKED WY PLYWOOD & INSPECTION DOORS WIRED OPEN TO ACHIEVE 100% RA.
* SEE EXHAUST FAM SCHEDULE - Problem has be corrected?

Page 27_of41

MECHANICAL_EQUIPMENT_DATA	·
AIR HANDLING UNITS: MANUFACTURER UNKLOWN AHU NUMBER: 61 AHU TYPE: HORIZON LOCATION: AREA 6 SPACE	ODEL NO. TAL CELING MOUNT SERVED: AREA
FAN DATA: SUFFLY FAN HF: ~ 1/2 SUFFLY CFM: COTO RETURN FAN HF: — RETURN CFM: — EXHAUST FAN HP: — EXHAUST CFM: — MOTOR STARTER: MNT MOM . SWITCH: THER LOCKED W/ PROV 6-1 COILS: HEATING: HW _ STM / DIRECT FIRED COOLING: CW _ DX _ FROM CHILLER	F.B 11.0.711 21.000.
NO REHEAT: # OF COILS TYPE REC NO HUMIDITY: STM SPRAY ELC HW/C	* 05 00160
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXE R.A. DAMPER: Y (Y, N), IF YES, FIXE E.A. DAMPER: N (Y, N), IF YES, FIXE ECONOMIZER: N (Y, N), IF YES, UA OA LEAKAGE: N (Y, N), IF NO, CAN E	ED 0%, MODULATING =% TO =% ED 00%, MODULATING =% TO =% ED =%, MODULATING =% TO =% ERA ENTHALPY ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRFOO	DR UNK
*FRESENT OPERATION: MON - FRI *FRESENT OPERATION: TO	TO TO
DAY NIGHT DAT MIC	COOLING SETFOINTS DS WEEKDAYS WEEKENDS GHT DAY NIGHT DAY NIGHT
*FRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH):	HUMIDISTAT LOCATION:
*FRESENT TEMF:	HUMIDISTAT LOCATION: DECK'F, COLD DECK'F T OPERATIONAL \(\frac{1}{2}\) (Y, N)
*FRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): SYSTEM SETPOINTS: MIXED AIR 'F, HOT IT TIME CLOCK: Y (Y, N), IF YES, IS IT CONTROLS: PNEUMATIC, ELECTRIC	HUMIDISTAT LOCATION: DECK 'F, COLD DECK 'F T OPERATIONAL (Y, N)
*FRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): SYSTEM SETPOINTS: MIXED AIR TIME CLOCK: Y (Y, N), IF YES, IS I CONTROLS: PNEUMATIC, ELECTRIC EQUIPMENT CONDITION: EXCELLENT(E), GOOD H'STAT COMFR DAMPERS P LINK VALVES P ACTUATORS P BELTS MI OTHER	HUMIDISTAT LOCATION: DECK
*FRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): SYSTEM SETPOINTS: MIXED AIR TIME CLOCK: Y (Y, N), IF YES, IS I' CONTROLS: PNEUMATIC, ELECTRIC EQUIPMENT CONDITION: EXCELLENT(E), GOOD H'STAT COMFR DAMPERS P LINK VALVES P ACTUATORS G BELTS G MI	HUMIDISTAT LOCATION: DECK
*PRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): SYSTEM SETPOINTS: MIXED AIR TIME CLOCK: Y (Y, N), IF YES, IS I CONTROLS: PNEUMATIC, ELECTRIC EQUIPMENT CONDITION: EXCELLENT(E), GOOD H'STAT COMFR DAMPERS P LINK VALVES P ACTUATORS P BELTS MI OTHER	HUMIDISTAT LOCATION: DECK
*FRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): SYSTEM SETPOINTS: MIXED AIR TIME CLOCK: Y (Y, N), IF YES, IS I CONTROLS: PNEUMATIC, ELECTRIC EQUIPMENT CONDITION: EXCELLENT(E), GOOD H'STAT COMFR DAMPERS P LINK VALVES P ACTUATORS P BELTS MI OTHER	HUMIDISTAT LOCATION: DECK F, COLD DECK F T OPERATIONAL Y (Y, N) N, PNEUMATIC/ELEC (G), POOR (F) T'STAT AGES P FANS A SHEAVES A XING BOX A

Bldg No.: 8000 704E3

Page 28 of 41

MECHANICAL_EQUIPMENT_DATA
AIR HANDLING UNITS: MANUFACTURER LINKHOWN AHU NUMBER: 6-2 AHU TYFE: HORIZOUTAL, CELLING MOUNT LOCATION: AREA 6 SPACE SERVED: MACHINE PADIATOR SH
FAN DATA: SUFFLY FAN HF: 1/2 SUFFLY CFM: 6300 STATIC FRESS: 0.4 RETURN FAN HF: - RETURN CFM: - STATIC FRESS: - EXHAUST FAN HF: - EXHAUST CFM: - STATIC FRESS: - MOTOR STARTER: MNT MOM SWITCH: F.B. H.O.A. DISCON INTERLOCKED W/PRV 6-2 COILS: HEATING: HW STM DIRECT FIRED No DIL ELC OTHER COOLING: CW DX FROM CHILLER FROM DX UNIT REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY: STM SFRAY ELC HW/CW COIL VALVES: 2 WAY 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED Ø %, MODULATING = % TO = % R.A. DAMPER: Y (Y, N), IF YES, FIXED Ø %, MODULATING = % TO = % E.A. DAMPER: N (Y, N), IF YES, FIXED = %, MODULATING = % TO = % ECONOMIZER: N (Y, N), IF YES, OA = RA = ENTHALPY = NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIR:POOR UNK
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMF: *REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: Y (Y, N), IF YES, IS IT OPERATIONAL Y (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
H'STAT COMPR DAMPERS P_ LINKAGES A_ FANS A_ SHEAVES A_ VALVES P_ ACTUATORS A_ BELTS A_ MIXING BOX A_ OTHER
COMMENTS: SEE COMMENTS FOR UNIT 4-1

--> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8000 ZOUE 3

Control of the Contro

Page 200AL

- <u>WerdHutfhr Emntlighth</u>
AIR HANDLING UNITS: MANUFACTURER UNKNOWN MODEL NO. AHU NUMBER: 6-3 AHU TYFE: HORIZONTAL CELLING MOUNT LOCATION: AREA 6 SPACE SERVED: TOILET LOCKER RMS
FAN DATA: SUFFLY FAN HF: 24 SUFFLY CFM: 2130 STATIC FRESS: 045 RETURN FAN HF: - RETURN CFM: - STATIC FRESS: - EXHAUST FAN HP: - EXHAUST CFM: - STATIC FRESS: - MOTOR STARTER: MNT MOM . SWITCH: F.B. H.O.A. DISCON INTERLOCKED W/PRV 6-3 COILS: HEATING: HW STM DIRECT FIRED NS 01L ELC OTHER NO COOLING: CW DX . FROM CHILLER . FROM DX UNIT NO REHEAT: # OF COILS TYPE . RECOOL: # OF COILS TYPE NO HUMIDITY: STM SFRAY ELC . HW/CW COIL VALVES: 2 WAY _, 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED 0%, MODULATING -% TO -% R.A. DAMPER: Y (Y, N), IF YES, FIXED 10%, MODULATING -% TO -% E.A. DAMPER: N (Y, N), IF YES, FIXED -%, MODULATING -% TO -% ECONOMIZER: N (Y, N), IF YES, OA - RA - ENTHALPY - IF NO. CAN ECONOMIZER BE ADDED Y
FILTER CONDITION:GOODFAIRFOOR UNK
SYSTEM OPERATION: MON - FRI SAT SUN *FRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETFOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMF: HUMIDIFICAT ON REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR
CONTROLS: PNEUMATIC, ELECTRIS, FNEUMATIC/ELEC
equipment condition: excellent(e), GOOD(G), FOOR(F) T'STAT H'STAT _ COMPR _ DAMPERS P LINKAGES P FANS G SHEAVES G VALVES P ACTUATORS G BELTS G MIXING BOX G OTHER
COMMENTS: SEE COMMENTS FOR AHU 4-1
> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No. : 8000 704E 3

Page 30 of 41

DECHUNICHT FROITHENT DHIR
AIR HANDLING UNITS: MANUFACTURER LINKNOWN MODEL NO. AHLI NUMBER: J-L AHLI TYFE: HORIZONTAL, CEILING MOUNT, LOCATION: AREA 7 SPACE SERVED: STORAGE & REPAIR
FAN DATA: SUFFLY FAN HF: 5 SUFFLY CFM: 8300 STATIC FRESS: 07 RETURN FAN HF: - RETURN CFM: - STATIC FRESS: - EXHAUST FAN HF: - EXHAUST CFM: - STATIC PRESS: - MCTOR STARTER: MNT MOM - SWITCH: F.B. H.O.A. DISCON - INTERLOCKED W/PRV7-L
HEATING: HW _ STM / DIRECT FIRED No _ GIL _ ELC _ GTHER NO COOLING: CW _ DX FROM CHILLER FROM DX UNIT HOREHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE HW/CW COIL VALVES: 2 WAY _ , 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED Ø%, MODULATING —% TO —% R.A. DAMPER: Y (Y, N), IF YES, FIXED X%, MODULATING —% TO —% E.A. DAMPER: N (Y, N), IF YES, FIXED —%, MODULATING —% TO —% ECONOMIZER: N (Y, N), IF YES, OA — FA — ENTHALPY — OA LEAKAGE: 10 % IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOODFAIRPOOR UNK
SYSTEM OPERATION: MON - FRI SAT SUN *FRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETFOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
*FRESENT TEMP:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
H'STAT COMPR — DAMPERS P LINKAGES P FANS 4 SHEAVES 4 VALVES P ACTUATORS A BELTS 4 MIXING BOX 4
COMMENTS:
11.11.11. COURT AMOUNT AS ADDELLTIN
* SEE HEV UNIT SCHEDULE, ATTACHED AS APPENDIX > Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8010 FOLE 3

EMEROD STATE

Page 310f41

MECHANICAL_EQUIPMENT_DATA
HANDLING UNITS: MODEL NO. AHU NUMBER: 7-2 AHU TYPE: HORIZONTAL CELLING MOUNT LOCATION: AREA 7 SPACE SERVED: BATTERY CHARGING FREPAI
FAN DATA: SUPPLY FAN HP: 1/2 SUPPLY CFM: 3850 STATIC PRESS: 0.5 RETURN FAN HP: - RETURN CFM: - STATIC PRESS: - EXHAUST FAN HP: - EXHAUST CFM: - STATIC PRESS: - MOTOR STARTER: MNT _ MOM SWITCH: P.B H.O.A. / DISCON _ INTERLOCKED W/PRV7-Z
COILS: HEATING: HW _ STM _ DIRECT FIRED -> NG _ OIL _ ELC_ OTHER _ NO COOLING: CW _ DX _ FROM CHILLER _ FROM DX UNIT FROM CHILLER _ FROM DX UNIT FROM DX UNIT FROM DX UNIT FROM COILS _ TYPE _ RECOOL: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE NO HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY _ , 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED DOX, MODULATING _ % TO _ % R.A. DAMPER: N (Y, N), IF YES, FIXED _ %, MODULATING _ % TO _ % E.A. DAMPER: N (Y, N), IF YES, FIXED _ %, MODULATING _ % TO _ % ECONOMIZER: N (Y, N), IF YES, OA _ RA _ ENTHALPY OA LEAKAGE: _ % IF NO, CAN ECONOMIZER BE ADDED _ Y
FILTER CONDITION:GOODFAIRFOOR UNK
**TEM OPERATION: MON - FRI SAT SUN **PRESENT OPERATION: TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDIFICATION REQUIREMENTS
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: Y (Y, N), IF YES, IS IT OPERATIONAL Y (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT H'STAT COMPR DAMPERS P_ LINKAGES P_ FANS G_ SHEAVES G_ VALVES P_ ACTUATORS G_ BELTS G_ MIXING BOX G_ OTHER
COMMENTS: SEE COMMENTS FOR LINIT 4-1

Page 32041

MECHANICAL_EQUIPMENT_DATA
AIR HANDLING UNITS: MANUFACTURER UNKNOWN MODEL NO. AHU NUMBER: B-L AHU TYFE: HORIZOUTAL, CEILING MOUNT LOCATION: AREA 8 SPACE SERVED:
FAN DATA: SUFFLY FAN HF: -34 SUFFLY CFM: 2820 STATIC FRESS: 4 RETURN FAN HF: - RETURN CFM: - STATIC FRESS: - EXHAUST FAN HF: - EXHAUST CFM: - STATIC FRESS: - MCTOR STARTER: MNT MOM - SWITCH: F.B H.O.A DISCON - INTERLOCKED W/PRV 8-I
COILS: HEATING: HW _ STM L DIRECT FIRED NG _ GIL _ ELC _ OTHER _ LO COOLING: CW _ DX FROM CHILLER FROM DX UNIT FROM DX UNIT FECOOL: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE NO HUMIDITY: STM _ SFRAY _ ELC HW/CW COIL VALVES: 2 WAY 3 WAY
DAMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED 0%, MODULATING -% TO -% R.A. DAMPER: Y (Y, N), IF YES, FIXED 0%, MODULATING -% TO -% E.A. DAMPER: N (Y, N), IF YES, FIXED -%, MODULATING -% TO -% ECONOMIZER: N (Y, N), IF YES, DA - RA - ENTHALPY - OA LEAKAGE:
FILTER CONDITION:GOODFAIRFOOR UNK
SYSTEM OPERATION: MON - FRI SAT SUN *FRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMF:
*REQUIRED TMF: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 65'F, HOT DECK'F, COLD DECK'F TIME CLOCK: Y (Y, N), IF YES, IS IT OPERATIONAL Y (Y, N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
H'STAT _ COMPR _ DAMPERS P LINKAGES P FANS G SHEAVES G OTHER_
COMMENTS: SEE COMMENTS FOR UNIT 4-1
> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8000 FONE3

Fage 33 of 41

MECHANICAL EQUIPMENT DATA AIR HANDLING UNITS: MANUFACTURER LINKUDULU MODEL NO. AHU NUMBER: 9-L AHU TYPE: HORIZOLTAL, CELLING MOUNT . SPACE SERVED: FAN DATA: SUPPLY FAN HP: 43 SUPPLY CFM: 8000 STATIC PRESS: 0.6 RETURN FAN HP: __ RETURN CFM: __ STATIC PRESS: __ EXHAUST FAN HP: __ EXHAUST CFM: __ STATIC PRESS: __ MOTOR STARTER: MNT __ MOM __ SWITCH: F.B. __ H.O.A. __ DISCON __ INTERLOCKED W/ PRV 8-1 (SUMMER ONLY) HEATING: HW STM DIFECT FIRED OLL ELC OTHER NO COOLING: CW DX FROM CHILLER FROM DX UNIT NO REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE NO HUMIDITY: STM SFRAY ELC HW/CW COIL VALVES: 2 WAY , 3 WAY AMPERS: O.A. DAMPER: Y (Y, N), IF YES, FIXED X, MODULATING X TO X R.A. DAMPER: Y (Y, N), IF YES, FIXED X, MODULATING X TO X E.A. DAMPER: N (Y, N), IF YES, FIXED X, MODULATING X TO X ECONOMIZER: N (Y, N), IF YES, OA RA RA ENTHALPY OA LEAKAGE: Y Y IF NO, CAN ECONOMIZER BE ADDED Y DAMPERS: FILTER CONDITION: ___GOOD ___FAIR ___POOR UNK SYSTEM OPERATION: MON - FRI SAT SUN HEATING SETECINIS COOLING SETFOINTS MEEKDAA2 MEEKEND2 MEEKDAA2 MEEKEND2 DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMF: HU-11DIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION: SYSTEM SETPOINTS: MIXED AIR 65'F, HOT DECK ___'F, COLD DECK ___'F TIME CLOCK: Y (Y, N), IF YES, IS IT OPERATIONAL Y (Y, N) CONTROLS: PNEUMATIC _____, ELECTRIC _____, FNEUMATIC/ELEC _____ EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(F) T'STAT H'STAT — COMPR — DAMPERS P LINKAGES P FANS 4 SHEAVES 4 VALVES P ACTUATORS & BELTS & MIXING BOX & OTHER___ COMMENTS: GEE COMMENTS FOR UNIT 4-1 Fun mutor recently replaced; 5HP. Hi Est. Affly has been modified w/ an evap. cooler. on noof; Htgc.V. leaks by - replace. T-STAT Modeletes 3-Way Heating/ale: Other TSTAT modeletes O.A. & R.A. danger. Actuarors --> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8000 70NE 3

the state of

Page 34 of 41

*** FMEA_SURVEY_OBSERVATIONS__***

		,
	•	1
AIR HANDLING UNITS:		•
CONTEGU STRATEGY: SEE ATTACHED-		

ب جب جب جب الله بين جب حد بين بين بين جب من في من في جو في بين جب كو في بين جو في في بين من في بين من بين جب ع - الله بين من الله بين بين بين بين بين بين في في في بين جب كو في بين بين من في بين بين في بين بين بين بين بين ب	
ADDITIONAL AHU/SYSTEM COMMENTS:	
ADDITIONAL AROYSTSTEE COMMENTO:	
، سائند و ما نتر بن ما نتر و نتو نتر بد بد بد بد بد بد بد بد بد بد بد بد بد	
## ## ## ## ## ## ## ## ## ## ## ## ##	
	→ : .= ,
The state of the s	
THE RESERVE THE STATE OF THE ST	
The state of the s	

Bldg No.: 8000 70NES 1,2,3

Page 350f41

AREA 4/SHT MIG *** UNITARY HEATING EQUIPMENT ***

(((((((((((((((((((•		
UNIT NO.	TYFE	OUTPUT HEATING CAPACITY SOURCE	CFM	HP	STARTER & CONTROL	SETFOINT
4-1	<u>-UH</u> _	Z5MBH HW			SerCon	70°
4-2	FTR	LOMBH HW			(1	′r
4-3	<u>UH</u>	IZMBH HW			6	
4-4	<u>UH</u>	IZMBH HW:			<u></u>	
4-5	FTR	5MBH HW				··
4-6	114	ZEMBH HIL			\(\(\)	·
48	V#	ZOOMBH HLJ				/-
4-13	UH_	Z9MBH HLL			,	· · · · · · · · · · · · · · · · · · ·
		AREA	5	-	h	· · · · · · · · · · · · · · · · · · ·
5.5	<u>U+</u>	32 MBH HW				
F 10	UH	32 MBH HW			"	
		·				
· · · · ·						
		بين مين مين مين مين مين مين مين مين مين الله وي مين مين مين مين مين مين مين مين مين مي				
					·	
	-				et furnza	
NOTES:		unit heater, unit wall furnace, etc.				
		BOURCE> electric hot wate	r, etc.			
	STARTER 8	k CONTROL> momen 24 ∨			ned, line v ntained, etc	

24 v stat, self contained, etc.

AREA 6,7,8 *** UNITARY HEATING EQUIPMENT ***

UNIT NO.	TYPE	OUTPUT HEATING CAPACITY SOURCE	CFM	HP	STARTER & CONTROL	SETPOINT
10-6	U#_	14.3 MBH HW			GELF CONT.	70°
6-9	U++	ZZ.ØMBH HW			[:	
6-10	_U#	22.0 MBH _ HW			(1)	u
6-11	UH	GAMBH HW			(1	11
		AREA 7				
7-L	UH	27,0 MBH HW:			.0	/·
7-3	U++	ZZ. Ø MBH HW				
7-8	UH	300 MBH HW		·	u	
	76 6	AREA 8		:		
8-1	UH	22,5MBH thu			n n	tr
8-2	UH	22.5MBH HW			(f	
6-3A	UH	300MBH HW			11	"
8-3B	U++	35.0 MBH HW			٨	11
8-4A	UH-	350 MBH HW			A	t j
8·4B	UH	53.2 MBH HW			11	li
8-9C	UH	35.0 MBH HW			И	1(
		· · · · · · · · · · · · · · · · · · ·				
		RAME #:				
NOTES: T	YPE>	unit heater, unit wall furnace, etc.	entilat gas fi			

HEATING SOURCE --> electric, gas fired, oil, steam,

hot water, etc.

STARTER & CONTROL --> momentary, maintained, line v stat, 24 v stat, self contained, etc.

A CONTRACT OF THE STATE OF THE

AREA S *** UNITARY HEATING EQUIPMENT ***

UNIT NO	. TYPE	OUTPUT HEATING CAPACITY SOURCE	CFM	HP	STARTER & CONTROL	SETPOINT
9-1A	UH	43,0MBH HILL			SELECOUT	
S-1B		43.0 MBH HL			11,	<i>,</i> ,
9-1C	_ U#	430MBH HW				**
9-8	FIR	64 MBH HLL				
9-10A	_UH	630MBH HILL			<u> </u>	"
9-10B	<u>UH</u>	63.8MBH HW				. "
9-11	<u>FIR</u>	D'QWBH HM			ļ!	
9-16	EIR	9. LMBH HL			, y ,	
9-18	PTR	5.0 MBH HL			и	
5-13	PTR	10.6 MBH HLL		·	lı	## ## ## ## ## ## ## ## ## ## ## ## ##
<u> </u>						
a d						
	·					
						-
100 100 100 100 100 100 100 100 100 100					۔ مہ برہ مہ سے منت باہر گان نے شہ مہ مہ	* **
		## ## ## ## ## ## ## ## ## ## ## ## ##				
FILM #:	F	RAME #:				
NOTES:		unit heater, unit wall furnace, etc.	ventila	ator, duc	t furnace,	
		wall furnace, etc. OURCE> electric, hot water			l, steam,	
	STARTER &	CONTROL> moment	ary, n	naintaine	ed, line v s ained, etc.	

BLOG SODO

MECHANICAL EQUIPMENT DATA

EXHAUST FA	ANS:		•				
UNIT NO.	TYPE	AREA	USE	CFM	HF	STARTER & CONTROL	SETPCINT
EF7-4	_ROOF_		IPEXH	4K	4	ON-OFF/P	
PKV8-L	<u>u</u>	8	GENEXH	2.3.K.	~1/2	<u> </u>	INTERLAL
FKVB-2							ムニトルコセク
FRVS-1	- <u></u> !ı	9	ELECT REP.	8K.	~3/4	11	Gummer Interlock
PRVS-2			TOILET				
PRV4-4	11	4	_DYVQ	1350	~1/6_		(ZUNITS)
EF9-1	WALL	9	PHOTORM	300	~/10	<i>(1)</i>	
PRV4-L	ROOF_		DEGR PI	3.5K	~3/4		Therlock
PRV4-2		4	GENEXH	42K	~3/4		
PRV4-3	11	4	EQP ROM	<u> 94K</u>	~3/4_		
PRY7-1_			SMENG REP	_1.64	~1/10		INTERLOCK
PRV7-2		7	BATTERY RM	34K	-1_	<u> </u>	
FRY 1-3			DEGR PIT	1.4K	~1/2		
PRY14		7	HOOD EXH	ZK	~1/2_	41	
EF 4-L	<u> </u>	4	LIDLUY FAN	_38K	~2_		
PRV6L		<u>6</u>	WELD SHOP	5K	~]_	11	INTERLOCK
PRV62		6	RAD/MACH	3.55	<u>~34</u>		
PRV 6-3	11	6	TOILET/Lock.	J.96K	~/2	11	h
						·	a (na 1888 ann ann an 1881 ann an 1881 an 1881 an 1881 an 1881 an 1881 an 1881 an 1881 an 1881 an 1881 an 1881
		<u></u>					
FILM #:		FRAME #:					

NOTES: TYPE --> propeller, centrifugal, str.
STARTER & CONTROL --> momentary, maintained, line v stat,
24 v stat. self contained, etc.

Bldg No.: 8000 ZONE 3

and the second second second second

Salah Baran Baran Baran

MECHANICAL_EQUIPMENT_DATA

A 17 A 17 A	HEATING PLANT	
NUMBER OF UNITS: 3 MAKE & MODEL: 1) _ KI 2) _ KI 3) _ KI EQUIPMENT: _ BOILER	EWANTE LOLHY/ 3	MBH /
TYPE:STEAMHW FUEL: NAT GASE	CAST IRON WAT	ER TUBE. FIRE TUBE
MULTIPLE UNIT OPERATION SERIES #3 RUNS ALO	I SEQUENCE: JE 9M05/YRAF#山岩	2 ALTERNATE REMAINING 3 MOS
BURNER STAGES:		
•	,	#2:_37.5 GPH
BURNER TYPE: POWER: HOS 1 2 ONLY ATMOS:	MFR GORDON- MATT BLOWER ABOV 3/LOS- CONTRL 120/1/60- MFR	MOD NO. DUAL FUEL 69 AHF @CFM 1.2 A MOD No.
HOT WATER: SUPPLY	SIZE TEMPER	ATURE PRESSUREPSI
ETEAM: HEADER	SIZE TEMPER	PSI (DIE PRESSURE (DIE PSI
TED CAPACITY: MAX MAX	BTUH IN #122-52500 BTUH OUT	MBH/#3-2653 MBH
CONTROLS: TYPE ELEC CONDITION J	TRIC EXCELLENT	
PLANT AUXILIARIES: PUMPS: HW 1)/	/ – A	HP
. 2)/	/AA	
2)/	/AA	
	/AA	HP HP
AUX OPERATING SCHEDULES PUMPS: HW 1)ON		OFF
COND 1)ON	OFF 2)ON	OFF 320NOFF
OTHER: 1) ON		OFF
XILIARY FUEL USED:	#2 DIL NAT	GAS OTHER

Bldg No.: 8000 ALL FOLES

Page 900191

	_ ₅₀ _0		t
DPERATING SCHEDULE:	DATE STARTED LONG	INUOUS	
* PRESENT OPERATIO * REQUIRED OPERATI			SUN TO TO
OTHER PLANT COMMEN PLOW BOILER PIL PERHAPS DOWN-S PEEN SERVICED	ots out Boller Ize a Change-out	S HAVE EXCESSI	IVE CAPACITY, HAVE NOT
MIHW ?			
FILM #: FRAM	E #:		

--> Disregard if the item is the same as the GENERAL BUILDING DATA.

Bldg No.: 8000-ALL ZONES

SKETCH:

Page 41 of 41

4	*** FMEA_SURVEY_OBSERVATIONS :***
	(3-17-93 OM)
	GENERAL BUILDING DATA
	URVEYED BY: PK/WW DATE: 12-12-85 BLDG CONTACT: CONTACT TELEPHONE NUMBER: XZO19/6225 BLDG USAGE: MAINTENCE FACILITY
	TOT BLDG AREA: ZOZ 800 SF # OF FLOORS: # OF PEOPLE: 190
	BUILDING OCCUPANCY: MON - FRI: 1000 TO 1000 FIRST SHIFT: SECND SHIFT: SECND SHIFT: TO THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
	ENVIRONMENTAL CONDITIONS:
	HEATING SETPOINTS COOLING SETECINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS
	PRESENT T'STAT: GSF GSF GSF GSF GSF GSF GSF GSF GSF GSF
	THERMOSTAT LOCATION(S): EACH AREA HUMIDIFICATION REQUIREMENTS (RH): - H'STAT LOCATION(S): -
11	LIGHTING:
	EN AREA (SF) LAMP TYPE #LMPS W/SF SCHEDULE 1) 58160 FL/HPS (49,597W) - 0.863 ON OFF
	2) 136,790 FL/HOS/INC (140,945 W) - LOGO ON OFF
	A) DATA SOURCE: X OBSERVATIONASHRAEOTHER SE ATTACHED SCHEDULE? XYN PP 5-9
	ELECTRIC EQUIPMENT:
1	AREA (SF) TYPE (KW) W/SF SCHEDULE 1 58160 Motors, Misc 29.86 0.513 on off 2 136,290 Motors, Misc 309.10 2.232 on off
	4) ON OFF
	DATA SOURCE: X DESERVATIONASHRAEOTHER SEE ATTACHED SCHEDULE? XYN PP LO
	INTERNAL MASS: MATERIAL: YELLICES, EQUIP ESTIMATED MASS: _ (L, M) H)
	INFILTRATION: LOCATION(S): OUGENEAD DOORS

ZONE 1

CEMPLIN ET CRACK 6016 ACFM DAY
ZOZI ACFM WITE

Bldg No.: P-8030

and the second second

ESTIMATED RATE: ____(L, M, H) or ____AIR CHANGES or

Page Lof 15

ZONE Z ZOTOB ALFM DAY

S157 ACPM NITE

*** FMEA_SURVEY_OBSERVATIONS__***

	_			
CONSTRUCTION: WALLS: CONSTRUCTION CON A) MTL PNL/AR SRC/IN B) B CONC/RIG INS/ C.) INS MTL PNL/ARS	MPONENT WIDTH SMTLPNL N: 3000 44CMU E: 152 SPC/NSMTLS: 160 W: 212	<u> </u>	AREA (SF) (2000) 2445 3621 4720	U-VALUE D.Ø]Ø Ø,Ø]\$ Ø.Ø]L O.Ø]Ø
	10 INS/MIZ 1: 120		AREA (SF) 58,160	u-value Ø.039
S:	TYPE SF X SLAB _ CRAWL LF INSULATION:		SP DP _ SP DP _	_ DRAPES _ DRAPES _ DRAPES
SPECIAL AREAS:				
NOTES:				~~~
FILM #:FRAME	#:	ملك شاه شاه شاه شاه بان بان سال الله بان		
SKETCHES:				

GENERAL BUILDING DATA CONSTRUCTION: WALLS: AREA (SF) U-VALUE 27,4261 0.075 WIDTH HEIGHT CONSTRUCTION COMPONENT MT AUL/AIRSOC/INS MT. AUL N: 800 34.61_ 11,253,2 0.017 31,548,5 0.014 9,893,2 0.076 PS CONC/RIGINS/4"CMU E: 376 INS MT PNL/AIR SYC/105 S: SAO R) PS CONC/KIGING/ 4" CMU E: S C) INS MT PNL/AIR SPC/ IUS S: S MIL PNL ROOFS: AREA (SF) U-VALUE LENGTH CONSTRUCTION, COMPONENT WIDTH BUILT UP ROOF/ RIG INS/MTL 1:234.9 580 136,240 Ø.Ø39 DECK 2: WINDOWS: TYPE AREA (SF) __ SF X DF _INSULATED_____ N: 19.5 __ SP __ DP SP X DP __ DRAPES __ SP __ DP __ DRAPES s 58.5 _____ FLOOR TYPE: AREA: _____SF __ SLAB __ CRAWL SPACE __ BASEMENT __ OTHER* FERIM: ____LF INSULATION: __Y __N __IN _____

SPECIAL AREAS:

FILM #:_____FRAME #:_____

NOTES:

SKETCHES:

*** FMEA SURVEY OBSERVATIONS ***

GENERAL BUILDING DATA
ELLANEOUS BASE LOADS: STIC HOT WATER: MANUFACTURER & MODEL UNKNOWN (SEG COMMENT) FUEL SOURCE NAT GAS ELEC OIL STM GEN X OTHER* SUPPLY TEMPERATURE FF, DISTANCE FROM HEATER FT INPUT RECOVERY RATE OPERATING SCHEDULE
TYPE SHEDULENO SCHEDULE CONTROL CONTROL SCHEDULE SCHEDULE CONTROL CONT
ADDITIONAL COMMENTS: DHW GENERATED BY HTM CONVERTER, 1000°E
KISE, RECOVERY RATE UNKNOWN - ENERGY CONSUMED IS
ESTIMATED AT 42,989 BTUH FOR BOTH FONES
·
FILM #: FRAME #:
ADDITIONAL SKETCHES:

Secify in "Additional Comments"

Bldg No.: <u>P-8030</u>

Page 4 of 15

GENERAL BUILDING DATA

LIGHTI	NG SCHED	ULE 70	NE T		Pageof
AREA:	(A) MAIN (A)	58,160	SF	(B) _ (B) M	EZZXSF
DATA S	SOURCE:	_DRAWINGS	X su	RVEY TOL	JR
Mark	#lamps	W/Fix	#Fix	! Flr #	; Comments
FL	154	177	77	A	APEA A INTERIOR
FL !	24	112	8	<u> </u>	AREA A INTERIOR
FL!	66	<u> </u>	33	<u> </u>	AREA A WITERIOR
					APEA 'A' INTERIOR
HES!	70	465	70	<u> </u>	APEA'A' INTERIOR
HPS!	6	95	6	<u> </u>	'AREA'A' EXTERIOR
HOE!	3	1305	3	' A	AREA 'A' EXTERIOR
FL	طل	77	පි	A	AREA 'B' INTERIOR
FL	16	1 48	16	; <u>A</u>	: AREA 'B' INTERIOR
1185	45	305	95	: A	AREA'B' INTERLOR
465	<u></u>	465	<u></u>	<u> </u>	AREA 18' INTERIOR
495	4	305	4	i A	APEA 'B' INTERIOR
					AREA 'B' INTERIOR
462	<u> </u>	95	<u></u>	1 A	AREA 'B' INTERIOR
#185	- 1	· 65		1 A	AREA 'B' EXTERIOR
(A) TO	TAL:		Watt	:s/	SF= W/SF
(B) TO	TAL:		Watt	:s/	BF=W/EF
ADDIT	IONAL NOT	ES:			

Franklin Children Comments States and Children Comments of the Comment

*** FMEA SURVEY DESERVATIONS ***

	NG SCHED F ROTPDT		LIF 1						Face Z	_ 5†
	·	_							1 2144	
AREA:	(A)MAIN_ (A)	25) TP	2 SF		(B) M	1E Z	zx	SF		
DATA S	SOURCE:	_DFAWING	sss	JRVE	Y TOL	JR:				
			*							
HPS!		305	_ل_ان	<u> </u>	A	!	AREA 'B'	EXTE	2108	
HPS!	40	· 3\$5	140		<u>A</u>	¦ 	APEA LC	' INTE	RIOR	
HPS!		95	<u></u>	¦ 	A	:	AREA L	C'EXT	erior	
							ARGA L			
									<u></u>	
!		!								
		:	1			-				
		:	!	; ·	, ودور النبية النبية النبية النبية النبية	1			, 	
		!	!	:		;				
			!	:						
		-	!		. — — — —	:				
		:	 	:						
. !			 !	:		!	,			
		·				- -				
	-01 10	. EQ7			<u> </u>		1.1-10	c=- M 9	ストス _{ほど} っ	=====
							160			
(B) TOT	TAL:		Wat	ts/_				_55=	W/8	er .
ADDITI	ONAL NOT	ES:				~		v (.ln-	-	res —
EXT	GRIOR LI	GHTS A	RE NO	T II	sclu	D	नाठा ui O	~ V-141	ات ، حاد	

Bldg No.: P-8030

Page 6_of15

GENERAL BUILDING DATA

LIGHTING SCHEDU	ILE ZONE C		
AREA: (A)MAIN1	36,240_sf	(B) M	EZZSF X
DATA SOURCE:	DRAWINGS <u>X</u> SU	JRVEY TOU	IR .
Mark #lamps			
FL 136	77 68	<u> </u>	AREA 'ZC' INTERIOR
= 174	177 62	<u> </u>	AREA '2C' INTERIOR
EI 1 300	112 10	<u> </u>	'AREA 'ZC' INTERIOR
I! ! 8	154 2	<u> </u>	'AREA '2C' INTERIOR
# Z	177 1 1	<u> </u>	AREA '2C' INTERIOR
HP: 1 30	1965 30	<u>'</u> A	! AREA 'ZC' INTERIOR
102 7	1 3ns 1 7	A	AREA 'ZC' INTERIOR
HPC 3	305 3	<u> </u>	'AREA '2C' EXTERIOR
	170 L		ARGA 'ZC' EXTERIOR
	: 71 : 39		'AREA 'D' INTERIOR
EL. 24	112 18	<u> </u>	AREA 'D' INTERIOR
HQG 1 7.9	1 465 29	<u> </u>	AREA'D'INTERIOR
HPS 128	1100 18	<u> </u>	AREA DINTERIOR
1200_ 7	305 7	' A	AREA'D'EXTERIOR
FL 132	177 66	- A	AREA 'E' INTERIOR
			SF= W/SF
			W/EF

Bldg No.: P-8030 ZONE 2

The second street are selected to be a second to the second secon

		DULE FOR	1F 7			•			o	<u>4</u> of
					,	D) ME	77		rage	II_0+
HIVEH:	(A)	136,240			Ć.	B)	X		•	
DATA :	BOURCE:_	DRAWINGS	3S	URV	ΈΥ	TOUR				
Mark	: #lamps	W/Fix	#Fix	;	Flr	# !		Comments		
FL_	7	148	7		A		AREA'E	'INTERIC	و_	
FL	74	. 77	12	<u> </u>	A		AREA'E	'INTERIO	2	
FL	6	18L	_3_	:	<u>A</u>	:	AREA'E	'INTERIO		
FL_	12	<u> </u>	6	!	A	!	AREA LE	'INTERIO	<u> </u>	
INC		200			A	·	AREA L	INTERIOR	ے	
485	24	465	24	:	A		AREA'E	INTERIO	<u>e</u>	· · · · · · · · · · · · · · · · · · ·
HPS!	Z	305	2	ţ	A	:	ARED'E	1 INTERIOR	2	•
								' INTERIOR		
P5	5	1 305 1	5	:	<u>A</u> _	:	AREA LE	'EXTERIO	<u></u> _	
FL!	132	: 77 :	66	!	A	: 	APEA 'F	'INTERIO	e_	
EL!	7	148 1		!	A	:	AREA F!	INTERIOR	re	
FL!	24	<u> </u>	12	!	A	!	AREA'E	INTERIOR		
FL:	6	181	_3_	!	Δ	:	AREA F	'INTERIO	<u> </u>	~~~~~
FL!	12	177 1	6	:	A	;	AREA 'F'	11) TERIOR	2_	
								'INTERIO		
(A) TOT	AL:		Watt	s/_				_SF=	W	/SF
								_3F=		

ADDITIONAL NOTES:

GENERAL BUILDING DATA

LIGHTING SCHEDULE ZONE Z	Page <u>5</u> of <u>5</u>
AREA: (A) MAIN 136, 240 SF	(B)MEZZXSF
DATA SOURCE:DRAWINGSSL	JRVEY TOUR
Mark #lamps W/Fix #Fix	Fir # Comments
	A AREA'F' INTERIOR
HPS 2 305 2	A AREA'F' INTERIOR
	A AREA'F'INTERIOR
HPS 5 1305 5	A AREA'F' EXTERIOR
	A AREA 'G' INTERIOR
FL 36 17 18	' A ' AREA 'G' INTERIOR
El 6 81 3	A AREA G'INTERIOR
NC 1 200 1	' A ' AREA 'G' INTERIOR
	A AREA G'INTERIOR
	: A ! AREA 'G' INTERIOR
	A AREA 'G' EXTERIOR
;	1
10.75701 \AC AES West	ts/_ 136,240SF=_1.06 W/SF.
	ts/SF=W/SF
ADDITIONAL NOTES:	OT INCLUDED IN TOTAL WATTS FIGURES -
EXIEKTUE DIGHTS THE IN	- · · · -

*** FMEA_SURVEY_OBSERVATIONS__***

GENERAL	BUIL	DING	DATA

1 "
1
1 39/30 50
A 33.55 A
10.0000
46,411,50

AREA 2002-8005F

(A) MAIN_50,160_SF

(B) MEZZ 136740 SF

ELECTRICAL EQUIPMENT:

QTY	: KW :	DESCRIPTION	COMMENTS
1	5.6	7.5HP HY FAN ZONEL	
		15 HP HV FAN ZONE L	
		14PUH FAN ZONE L	
4	74.6	25 HP HV FAN ZONE Z	
2	44.7	30 HP HV FAN ZONE Z	
		40 HP HV FAU ZOUE Z	
	1		
	1		
	1		·
	1	!	!
	1		1
	!		
	!		1
	1		!
	:		!
	!		
	!		

(A) TOTAL: 29850 Watts/ 56, 160 SF= 0.513 W/SF

(B) TOTAL: 304,102.8 Watts/ 136,240 SF= 2.232 W/SF

*** FMEA SURVEY OFSERVATIONS ***

MECHANICAL	EQUIPMENT	DATA

Bldg No.: P8030

FALLS AND STREET STREET

AIR HANDLING UNITS: MANUFACTURER MSQUAY MODEL NO. AHU NUMBER: HVU-1 AHU TYPE: 570 LOCATION: MEZZANINE SPACE SERVED: AREA 1
FAN DATA: SUPPLY FAN HE: 7-5 SUPPLY CFM: 80000 STATIC PRESS: 15"W.C. RETURN FAN HP: RETURN CFM: STATIC PRESS: EXHAUST FAN HP: EXHAUST CFM: STATIC PRESS: MOTOR STARTER: MNT MOM SWITCH: P.B. H.O.A. DISCON
COILS: HEATING: HW X STM DIRECT FIRED> NG DIL ELC OTHER GOOLING: CW DX FROM CHILLER , FROM DX UNIT REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY , 3 WAY
DAMPERS: O.A. DAMPER:(Y) N), IF YES, FIXED%, MODULATING% TO% R.A. DAMPER:(Y) N), IF YES, FIXED%, MODULATING% TO% E.A. DAMPER:(Y) N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER:(Y, N) IF YES, OARAENTHALPY OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:FAIRFOOR
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO *REQUIRED OPERATION: TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y. N), IF YES, IS IT OPERATIONAL (Y. N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT G H'STAT GOMPR GAMPERS GALINKAGES GAFANS GABLES
Heat Wheel disabled; R.A. Danpar disabled - wired open; Z"-s way HWO.V., p now obscored Reheat Coths present. Blanch control (on/orf switch) on Heat Wheel.
District Committee of the control of

N Page 11_of 15

*** FMEA_SURVEY_OBSERVATIONS ***

MECHANICAL_EQUIPMENT_DATA
HANDLING UNITS: ANUFACTURER MODEL No. AHU NUMBER: HVIIZ AHU TYPE: SEU DRAW THRU LOCATION: SPACE SERVED:
SUPPLY FAN HP: SUPPLY CFM: 19190 STATIC PRESS: 3.0 W.C. RETURN FAN HP: RETURN CFM: STATIC PRESS: 3.0 W.C. EXHAUST FAN HP: 15 EXHAUST CFM: 19,150 STATIC PRESS: 3.0 W.C. MCTOR STARTER: MNT MOM SWITCH: P.B H.O.A. X DISCON
COILS: (304) HEATING: HW X STM DIRECT FIRED> NG OIL ELC OTHER COOLING: CW DX FROM CHILLER FROM DX UNIT FEHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY , 3 WAY
DAMPERS: O.A. DAMPER:
FILTER CONDITION:500D X_FAIRFOOR
FEM OPERATION: MON - FRI SAT SUN *FRESENT OPERATION: TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REGUIRED TMP: HUMIDIFICATION REGUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: FNEUMATIC X, ELECTRIC . FNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) TISTAT — HISTAT — COMPR — DAMPERS G LINKAGES G FANS G SHEAVES G VALVES G ACTUATORS G BELTS G MIXING BOX G OTHER COMMENTS: 14" 3-Way Value on 14"
COMMENTS: 17 3-way value on 1900
}

Bldg No.: P8030

MECHANICAL EQUIPMENT_DATA

AIR HANDLING UNITS: MANUFACTURER AHU NUMBER: #V3/4AAHU TYPE: SEU DRAW THRU LOCATION: MEZZANINE SPACE SERVED:
SUPPLY FAN HP: 251 SUPPLY CFM: 3194 STATIC PRESS: 30 WC RETURN FAN HP: 751 EXHAUST CFM: 3194 STATIC PRESS: 30 W.C EXHAUST FAN HP: 751 EXHAUST CFM: 3194 STATIC PRESS: 30 W.C MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A. X DISCON
COILS: 3-WAY 2* HEATING: HW STM DIRECT FIRED> NG OIL ELC OTHER COOLING: CW DX FROM CHILLER , FROM DX UNIT REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY: STM SPRAY ELC HW/CW COIL VALVES: 2 WAY , 3 WAY
DAMPERS: O.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% R.A. DAMPER:(Y, N)
FILTER CONDITION:GOOD X_FAIRPOOR
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO
<u>HEATING SETPOINTS COOLING SETPOINTS</u> WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT
*PRESENT TEMP:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: FNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), FOOR(F) T'STAT G H'STAT COMPR DAMPERS G LINKAGES G FANS G SHEAVES G_ VALVES G ACTUATORS G BELTS G MIXING BOX G
COMMENTS:

Bldg No.: <u>P8030</u>

Page 13 of 15

*** FMEA SURVEY OBSERVATIONS ***

MECHANICAL EQUIPMENT DATA
HANDLING UNITS: ANUFACTURER AHU NUMBER: 4148 AHU TYPE: STU DRAW THRU LOCATION: MEZZANINE SPACE SERVED:
SUPPLY FAN HP: 30 SUPPLY CFM: 38.3 STATIC PRESS: 3.0 RETURN FAN HP: RETURN CFM: STATIC PRESS: STATI
COILS: 74.3041 HEATING: AW X STM DIRECT FIRED> NG OIL ELC OTHER COOLING: CW DX FROM CHILLER FROM DX UNIT
DAMPERS: O.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% R.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% E.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER:(Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER:(Y, N), IF YES, OA RA ENTHALPY OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
FT TER CONDITION:GOOD X_FAIRPOOR
EM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, (Y, (T))), IF YES, IS IT OPERATIONAL (Y, (T))
CONTROLS: FNEUMATIC, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT G H'STAT — COMPR — DAMPERS G LINKAGES G FANS G SHEAVES G VALVES G ACTUATORS G BELTS G MIXING BOX G
COMMENTS:

Bldg No. : P8080

Page 14_of15

MECHANICAL_	FOLLTEMENT	DATA
MECUHNICHE"	<u> </u>	

MANUFACTURER MODEL NO. AHU NUMBER: #V 5/6/7 AHU TYPE: SZU DRAW THEU LOCATION: MEZZANINE SPACE SERVED:
SUPPLY FAN HP: 40 SUPPLY CFM: 51K STATIC PRESS: 30 RETURN FAN HP: - RETURN CFM: - STATIC PRESS: - STATIC PRESC: - STATIC PRESS: - STATIC PRESC: - STATIC PRESC: - STATIC PRESC: - STATIC PRESC: - STATIC PRESC: - STATIC PRESC: - STATIC PRESC: - STATIC PRES
COILS: 2 3 MY VALUE - PURUMATIC TUBE DISCOUNTED ON HU 5 & 6 HEATING: HW X STM _ DIRECT FIRED> NG _ GIL _ ELC_ GIHER _ SOOLING: CW _ DX _ FROM CHILLER, FROM DX UNIT REHEAT: # OF COILS _ TYPE RECOOL: # OF COILS _ TYPE HUMIDITY: STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY _ , 3 WAY
DAMPERS: O.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% R.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% E.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER:(Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER:(Y, N), IF YES, OA X RA ENTHALPY OA LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:600D X_FAIRPOOR
STEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y, N), IF YES, IS IT OPERATIONAL (Y, N)
CONTROLS: PNEUMATIC X, ELECTRIC, PNEUMATIC/ELEC
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT 6_ H'STAT COMPR DAMPERS 6 LINKAGES 6 FAMS 6 SHEAVES 5 VALVES 6 ACTUATORS 6 BELTS 6 MIXING BOX 6
COMMENTE: HV7 - HeatWheel chain disconnected; R.A. daspar actuator disconnected.
Fixed in open postion. Best control on Heat Wheel. 2 Mixing Value on HW coils disconnected.
HU5 \$7 SUPPLY FAN NAMPLATE 15 MIGGING

Bldg No.: P8030

and the first of the second

Page 15 of 15

	GENERAL BUILDING DATA
*	BLDG #: P8142 BLDG NAME: D/S MAINTENANCE FACILITY JOB #: 124 SURVEYED BY: DK DATE: 12-12-84 BLDG CONTACT: SFC WEBBER CONTACT TELEPHONE NUMBER: X5160/5904 BLDG USAGE: VEHICLE REFAIR TOT BLDG AREA: 45,112 SF # OF FLOORS: 1 # OF PEOPLE: 120
	BUILDING OCCUPANCY: MON - FRI: 1000 TO 1630 FIRST SHIFT: SATURDAY: TO SECND SHIFT: SUNDAY: TO THIRD SHIFT: HOLIDAYS: TO HOLIDAYS:
	ENVIRONMENTAL CONDITIONS:
	HEATING SETPOINTS COOLING SETECINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT PRESENT T'STAT: SEE NOTES
	HUMIDIFICATION REQUIREMENTS (RH): H'STAT LUCATION(S):
	LIGHTING: N AREA(SF) LAMP TYPE #LMPS W/SF SCHEDULE 1) 20,376 HPS/FL 25,527 60 1.25 ON OFF 2) 7,874 FL 10,874 746 1.35 ON OFF 3) 10,396 FL 7,484 166 0.72 ON OFF 4) 6576 FL 7,22 1.78 1.19 ON OFF DATA SOURCE: X OBSERVATIONASHRAEOTHER SEE ATTACHED SCHEDULE?Y XN
	ELECTRIC EQUIPMENT: 2N AREA (SF) TYPE (KW) W/SF SCHEDULE 1) 20,376 MOTORS (33 HP) Z4.6 1.21 ON OFF 2) 7,624 MOTORS (5,25 HP) 6.9 0.88 ON OFF 3) 10,396 MOTORS (11 HP) 8.2 0.79 ON OFF 4) 6576 MOTORS (9,6 HP) 7.2 1.09 ON OFF DATA SOURCE: OBSERVATION ASHRAE OTHER SEE ATTACHED SCHEDULE? Y N
	INTERNAL MASS: MATERIAL: VEHICLES, EQUIP ESTIMATED MASS: _ (L, M) H)
	INFILTRATION: LOCATION(S):
	ESTIMATED RATE:(L, M, H) orAIR CHANGES orCFM/LIN FT CRACK
	FONE 1 FONE 3 FINE 4
	ZONE Z ZONE 3 ZONE 4 2008 ZONE Z ZONE 3 ZONE 4 2008 ACFM DAY 6900 ACFM DAY 68 ACFM DAY 2009 ACFM NITE 6900 ACFM NITE 68 ACFM NITE

GENERAL BUILDING DATA

ONSTRUCTION:
WALLS: CONSTRUCTION COMPONENT OUT OF THE PART OF THE
ROOFS: CONSTRUCTION COMPONENT WIDTH LENGTH AREA(SF) U-VALUE BUILT UP ROOF/3" RIGINS/ 1: 120.57 L69 20.316 0.09 MTL DECK 3:
WINDOWS: AREA (SF) N: 400 E: 12.0 W: 600 TYPE X SF DP DRAPES X SP DP DRAPES X SP DP DRAPES X SP DP DRAPES
FLOOR TYPE: AREA:SF X SLAB _ CRAWL SPACE _ BASEMENT _ OTHER* FERIM:LF INSULATION: XYN ZIN RIGID TO ZA" SPECIAL AREAS:
NOTES: TEMPERATURES BY FONES:
ZONE 1 ZONE 2 ZONE 3 ZONE 4
POFFENT: 65°F/56°F 70°F/60°F 65°F/65°F 70°F/60°F
RED'D: 55°F/55°F 65°F/55°F 65°F/55°F
FILM #:FRAME #:
SKETCHES:

GENERAL BUILDING DATA

CONSTRUCTION: WALLS:			•	
CONSTRUCTION COMPONENT A) 4°CMU/2" RIGINS/B°CMU B) MTL PNL/3°PIGINS/MTL PNL	E:	-1Q'8-	AREA (SF) 20296	<u> </u>
	s: 28.0 w: 102.56	11.33 15.26	485.3 1564.0	0.09 0.09
ROOFS: CONSTRUCTION COMFONENT, PUILL UP ROOF / 3" RIGINS/ MIL DECK / AIR SPC /ACOUST SUSP CEILING	width _ 1: 70.20 _ 2: 3:	LENGTH	AREA(SF)	
WINDOWS: AREA(SF) N: E: S: 360 W: 48.0	_	- - - - - - - - -	SP DP _ SP DP _ SP DP _ SP DP _	DRAPES DRAPES DRAPES DRAPES
FLOOR TYPE: AREA: <u>1824</u> SF SLA PERIM:LF IN	B CRAWL SULATION: _	SPACE _YN	BASEMENT]	∠ other*
SPECIAL AREAS:	**			·
NOTES: * ZND FLOOP OFFIC	55			
			· — — — — — — — — — — — — — — — — — — —	
<u></u>				
FILM #:FRAME #:				
SKETCHES.		•		

*** FMEA_SURVEY_OBSERVATIONS_ ***

PFWFQHF TROIT DTW DHID	
CONSTRUCTION: WALLS: CONSTRUCTION COMPONENT A)4"CMU/2"RIGINS/8"CMU N: 92.0 L3.0 B)MTLPNL/3"RIGINS/MTLPNL E: LL3.0 W: L13.0 L6.0	AREA (SF) U-VALUE 1196.0 0.09 1808.0 0.09
ROOFS: CONSTRUCTION COMPONENT WIDTH LENGTH BUILT UP ROOF/3" RIGINS/MIL 1: 92 LL3 DECK 3: 4: 4:	AREA(SF) U-VALUE
S:	SP DP DRAPES SP DP DRAPES SP DP DRAPES SP DP DRAPES DRAPES
AREA: 10396 SF X SLAB _ CRAWL SPACE _ PERIM: 318 _ LF INSULATION: XYN SPECIAL AREAS:	ZIN KIGID 10 24
NOTES:	:
FILM #:FRAME #:	
SKETCHES:	

ALC: N	

GENERAL BUILDING DATA

CONSTRUCTION:					
WALLS: CONSTRUCTION COMPONENT 1)4"(MI)/7"RIGINS/8"CMI	T WIDTH	HEIGHT	AREA(SF)		
WALLS: CONSTRUCTION COMPONENT A) 4"CMU/Z"RIGINS/8"CMU B) MTL PNL/3" RIGINS/MI PNL	T. E: ———————————————————————————————————	13.17	368.1 632.0	Ø,Ø9 Ø,Ø 9	
ROOFS: CONSTRUCTION COMPONENT	1: 2: 3:	LENGTH	AREA(SF)	U-VALUE	
N:	TYPE	<u>\$</u>	SP DF _ SP DP _ SP DP _ SP DP _	HONDER	
FLOOR TYPE: AREA: 6576.0 SF PERIM: 48.0 LF	SLAB CRAWL INSULATION:	SFACE YN _	BASEMENT RIGIO	OTHER*	
SPECIAL AREAS:					
NOTES:					
			, 		
FILM #:FRAME #:					
SKETCHES:					

*** FMEA SURVEY OBSERVATIONS ***

GENEVOE SOTENT	GA KOTO				
MISCELLANEOUS DOMESTIC HOT W MANUFACTURER EUEL SOURCE	ATER:	UNKNOWI	J	тм бей 🔀 отнег	
SUPPLY TEMPE	RATURE 11	<u>Z_</u> 'F, DISTAN	ICE FROM HEAT	ER ST CHEDULE	
TYPETOTAL KW	N(SCHEDUL	E E	_ CONTROL _ CONTROL	
FUNCTION OF	LIGHTS	_ SECURITY _ OTHER*			
			·	HIK CONERT	<u> </u>
	•				
	·				
		•			
FILM #:	FRAME #:				
ADDITIONAL SKE	TCHES:				
Chollad Water pung	p - ZHP B - 7.5HP	aldor Hi Efficienc Gould. for	y. for mz1 Bldg.		

* Specify in "Additional Comments"

Bldg No.: P8142

	MECHANICAL_EQUIPMENT_DATA
	AIR HANDLING UNITS: MANUFACTURER LINKNOWN TRAVE MODEL NO. CCBBIOGEEBO AHU NUMBER: MZL AHU TYPE: MULTI ZONE DRAW THRU LOCATION: SPACE SERVED:
	SUPPLY FAN HP: 742 EUPPLY CFM: 471 DESTATIC PRESS: 25 * RETURN FAN HP: 112 RETURN CFM: 9525 STATIC PRESS: 25 * EXHAUST FAN HP: 1/4 EXHAUST CFM: 1690 STATIC PRESS: 15 * MOTOR STARTER: MNT _ MOM SWITCH: P.B H.O.A. Y DISCON
2 1/2°-5w	COILS: AN HEATING:XHW X STM _ DIRECT FIRED> NG _ OIL _ ELC_ OTHER M COOLING:VCW X DX FROM CHILLER /FNTRAL , FROM DX UNIT REHEAT: # OF COILS TYPE RECOOL: # OF COILS TYPE HUMIDITY. STM _ SPRAY _ ELC HW/CW COIL VALVES: 2 WAY , 3 WAY
	DAMPERS: O.A. DAMPER:
	FILTER CONDITION:GOOD \(\sum_FAIRPOOR \)
	SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
	HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
	SYSTEM SETPOINTS: MIXED AIR
	CONTROLS: PNEUMATIC X ELECTRIC PNEUMATIC/ELEC
	H'STAT COMPR DAMPERS & LINKAGES & FANS & SHEAVES & VALVES & ACTUATORS & BELTS & MIXING BOX &.
	COMMENTS: X = ESTIMATEO
	4 Zones: 1/2"3-way C.V. on CW; 1/2" Hw 3-way Value.

Bldg No. 98142

Page 7_of 13

*** FMEA_SURVEY_OBSERVATIONS__***

MECHANICAL_EQUIPMENT_DATA		
AIR HANDLING UNITS: MANUFACTURER UNKNOWN MODEL AHU NUMBER: #W-1 AHU TYPE: HORIZONTA LOCATION: CEILING SPACE SER	NO. L DRAW THEY VED: AREA D'	
FAN DATA: SUPPLY FAN HP: 74, SUPPLY CFM: 41,25 X STA RETURN FAN HP: 24, RETURN CFM: 15,815 X STA EXHAUST FAN HP: 14 EXHAUST CFM: 1,580 X STA MOTOR STARTER: MNT MOM SWITCH: P.E	TIC PRESS: ¥75	3CON
COILS: HEATING: HW	, FROM DX GNI! # OF COILS T	/PE
DAMPERS: O.A. DAMPER:(Y, N), IF YES, FIXED E.A. DAMPER:(Y, N), IF YES, FIXED ECONOMIZER:(Y, N), IF YES, FIXED ECONOMIZER:(Y, N) IF YES, OA RA OA LEAKAGE: IF NO, CAN ECONO	%, MODULATING _ % %, MODULATING _ % %, MODULATING _ % _ ENTHALPY _ MIZER BE ADDED	TO% TO% TO%
FILTER CONDITION:GOOD X_FAIRFOOR		
SYSTEM OPERATION: MON - FRI	547	
*PRESENT OPERATION: TO *REQUIRED OPERATION: TO	TO ^	70 <u></u>
*PRESENT OPERATION: TO	TO TO COOLING SETFOING WEEKDAYS WEE DAY NIGHT DAY	TO NIS EKENDS NIGHT
*PRESENT OPERATION: TO	TO	TO TO NIS EKENDS NIGHT * * * * * Y
*PRESENT OPERATION: TO	TO	TO TO NIS EKENDS NIGHT * * * * * Y
*PRESENT OPERATION:TO	COOLING SETECTIONS WEEKDAYS WEE DAY NIGHT DAY MIDISTAT LOCATIONS "F, COLD DECK RATIONAL (Y, I) "PNEUMATIC/ELEC POOR (P) T'STAT FANS SHEAV BOX	TO TO YIS EKENDS NIGHT TF Y) VES
*PRESENT OPERATION:TO	COOLING SETECTIONS WEEKDAYS WEE DAY NIGHT DAY MIDISTAT LOCATIONS "F, COLD DECK RATIONAL (Y, I) "PNEUMATIC/ELEC POOR (P) T'STAT FANS SHEAV BOX	TO TO YIS EKENDS NIGHT TF Y) VES
*PRESENT OPERATION:TO	COOLING SETECTIONS WEEKDAYS WEE DAY NIGHT DAY MIDISTAT LOCATIONS "F, COLD DECK RATIONAL (Y, I) "PNEUMATIC/ELEC POOR (P) T'STAT FANS SHEAV BOX	TO TO YIS EKENDS NIGHT TF Y) YES

Bldg No.: 8142

Page **8** of 13

MECHANICAL EQUIPMENT DATA

AIR HANDLING UNITS: MANUFACTURER AHU NUMBER: MUC AHU TYPE: MAKE UP AIR UNIT LOCATION: MER SPACE SERVED:
FAN DATA: SUPPLY FAN HP: 1/2 SUPPLY CFM: 5525 STATIC PRESS: 425 RETURN FAN HP: RETURN CFM: STATIC PRESS: 425 EXHAUST FAN HP: 1/2 EXHAUST CFM: 3,175 STATIC PRESS: 4,25 MOTOR STARTER: MNT MOM SWITCH: P.B H.O.A DISCON
COILS: MARGINAL COLO. HEATING: HW X STM _ DIRECT FIRED> NG _ DIL _ ELC_ OTHER
DAMPERS: O.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% R.A. DAMPER:(Y, N) IF YES, FIXED%, MODULATING% TO% E.A. DAMPER:(Y, N), IF YES, FIXED%, MODULATING% TO% ECONOMIZER:(Y, N) IF YES, OARAENTHALPY OA*LEAKAGE:% IF NO, CAN ECONOMIZER BE ADDED
FILTER CONDITION:GOOD X_FAIRPOOR
SYSTEM OPERATION: MON - FRI SAT SUN *PRESENT OPERATION: TO TO TO TO TO TO TO TO TO TO TO TO TO
HEATING SETPOINTS COOLING SETPOINTS WEEKDAYS WEEKENDS WEEKDAYS WEEKENDS DAY NIGHT DAY NIGHT DAY NIGHT DAY NIGHT *PRESENT TEMP: *REQUIRED TMP: HUMIDIFICATION REQUIREMENTS (RH): HUMIDISTAT LOCATION:
SYSTEM SETPOINTS: MIXED AIR 'F, HOT DECK 'F, COLD DECK 'F TIME CLOCK: (Y) N), IF YES, IS IT OPERATIONAL (Y) N)
CONTROLS: PNEUMATIC, ELECTRIC, PNEUMATIC/ELEC X
EQUIPMENT CONDITION: EXCELLENT(E), GOOD(G), POOR(P) T'STAT H'STAT COMPR DAMPERS LINKAGES FANS SHEAVES VALVES ACTUATORS BELTS MIXING BOX OTHER
COMMENTS: X ESTIMATED
1"3-way HW C.V.

Bldg No.: 8192

Page Sof13

MECHANICAL	EQUIF	<u> 1ENT_DATA</u>	•				
UNITARY H	EATING E	EQUIPMENT:	HEATING	•		STARTER	
UNIT NO.	TYPE	CAPACITY	SOURCE	CFM	HP .	& CONTROL	SETPGINT
MUL	<u> </u>	106.5	MTW				
ASUM	<u> </u>	10925	MIW_	22000	*1/3		
MUZB	<u> 4</u> V_	109,25		22000		_AUTO_	
MU3	<u> </u>	248.3	MTKL	_3360	*1/2	AUTO	
MU4_	UV_	238.36	-MIK	3361	×1/2	AUTO-	7-400d-
MUS	777	268.2	MIM	3360	*1/2	_AUTO_	
MUT	<u> </u>	278.1	MTKL	3560	#1/Z_	AUTO	
MUS	<u> </u>	268.2	MIM	3360	*1/2.	OFF	
ALHU	<u> </u>	194.0	_MIM_	*4760	3/4		
UHIB	_HH_	144.0	MTW	*4760	3/4		
4HIC	<u> </u>	144.0	MIW	*4760	34		
JHID	<u> </u>	144.00_	-MIK-	×4760	3A		
UHLE_	<u> </u>	1440	MTH	*4760	<u> </u>		
UHZ	<u> </u>	80.0	MTW	*2100	43_		
UH 3A	114	366	MTW	412,700		· 	
<u>UH 3B</u>	<u> 44</u>	366	MTK	* 12700	<u>Z</u>		
UHZC	<u> </u>	366	MTK	×12700	<u>Z</u>		
UH3D	UH	366	MIL	1 + 12,700	<u> 2</u>		
UH 3F	LH	3do	MTk	1-12,70	<u>D</u> Z		
		wall furn	ace. etc.			ct furnace,	1
H	EATING	SOURCE>	electric	r, etc.		il, Steam,	et at

STARTER & CONTROL --> momentary, maintained. line v stat, 24 v stat, self contained. etc.

BIOG NO.: 8142 FONE 1

Page 10 of 13

WECHENTO	GE ENGTE	NENT THIE					
UNITARY	HEATING	EQUIPMENT: OUTPUT	HEATING			STARTER	
UNIT NO.		CAPACITY	SOURCE	CFM	_	& CONTROL	SETPOINT
UH JO	A UH	200	MIH	¥4730	43		
CH TO	B <u>4H</u>	200	MIW	¥4230	2/3		
		- ZO	JE 3				
UHSB	<u> </u>	4	MTKL	<u> </u>	1/25		
UH6A,B	C_4H	63	MTW	×1580	14		
•	<u> 4</u> H_						
LHBABO	D 14	44	MIN	*1580	1/4		
		ZON	1E 9-				
UH4							
UH5A	<u>4</u> H	4	MIK	¥ _Z oo	1/25		
						عة الله بسرية عن عن	
		·		•			
٠		, <u>, , , , , , , , , , , , , , , , , , </u>	•				
						·	
_, =							
			جنة ه <u>ي</u> جي جي جي جي وي وي وي وي			. 	
						•	
FILM #:		FRAME #: _	* Est	MATED			
NOTES:	TYPE	unit heat wall furr	er, unit	ventilat	or, di	uct furnace	•
	HEATING		· electri		red. o	oil, steam,	-
	STARTER	& CONTROL	> mome	ntary, ma		ned. line v ntained. et	

BID No.: 8192 FONE 1

Page 11 of 13

MECHANICAL_EQUIPMENT_DATA

ENLIQUET FANC.	•	•		
EXHAUST FANS:		CFM HF	STARTER & CONTROL	GETPOINT
UNIT NO. TYPE			_	
EF-Z CENT	I/L W/MU-L	1950 4	2 Auto	4.159
EF-3 CENT				
EF-4 CENT				
EF-5 CENT				
EF-6 CENT	IL W/MU-5	3360 1/	1 Auto	0.30
EF-7 CENT	I/L W/ML-7	3360 4	4 Auto	0.30
EF-8 CENT	T/L W/MU-8	3360 4	4 Auto	D. 30
EF-9 CENT	I/L W/MU-2B	22100 Y	1 Auto	9.25
EE-100A-E . CENT		_ PORTO -1	z T-Stats	0.25
EF-LLA-D LEUT		5000 1	2 I-Stets	<u> 0.15</u>
EF:12 (EVI_	I/L W/HV-L	1800 1	6 Auto	025
EF-13AB CENT		<u> </u>	12 <u>au/off</u>	025
EF:15 CENT		1200 1	12 <u>an/off</u>	4.00
EE'16_ CENT_	I/LW/MZ-L	<u> 5000 - 1</u>	6 Auto	<u> </u>
FE:17 CENT		_ 3=0 1	6 I-Stats	0.50
EF-18 A. B. CENT	T/6 w/MU 3 = 7	2000 4	12 Auto	M,50
FF-19 A.B COUT		4800_	3 on off	2.50
EF 20 A.B CENT		5400	3 ON/OFF	2,000
FF. 21 CENT		4200	1/3 T-STAY	025
EF-L GOVT	I/L W/MU-6	<u> </u>	1/3 Auto	0,50
	FRAME #: I/L= It	MERLOCKE	Q	
	·			

NOTES: TYPE --> propeller, centrifugal, etc.

STARTER & CONTROL --> momentary, maintained, line v stat,

24 v stat. self contained, etc.

MECHANICAL_EQUIPMENT_DATA

		} -	HEATING PL	ANT					
	DESCRIPTION						/		
NUMBE	ER OF UNI	TS:	NTRALP	» A . I — I	المراجم	1000in	1/		
MAKE	& MODEL:	1)	WIKHLY	CHNII	TOHLING	<u> ZOOLIA</u>	<u> 19</u>		
		2) 3)							
COLLE	OMENT.	entiee	DIREC	TETEED	STEA	M CONVX	T (20N)	JERTER.	
TYPE	STEAL	M HTHW	CAST IR	ON WA	TER TUBE	. FIRE T	UBE	0 = (= (= (= (= (= (= (= (= (= (
FUEL:	NAT GAS	EL	ECTRIC	OIL	от	HER			
			SEQUENCE:					•	
SERI	:s			PARALLE	:∟ຸ				
DUDAG	TO STAFES	_							
BURNE	IN STACES								
FIEL	NG RATE/F	UEL:#1:			#2:			·	
BURNE	R TYPE:_	POWER: M	1FR		M	OD No			
		E	1FR <u> </u>	_//	A	HP @	:	SFM	
e g alage e e e e e e e e e e e e e e e e e e		C	CONTRL	_//	A				
	9 -	ATMOS: M	CONTRL 1FR OK ?		M	OD No			
V	T WATER.	valvie &	SIZE 4	-eryae	EATURE 7	7/1/1/1 000	======================================	-Ø per	
- ∠ -⊓	JI WAIEK:	SUFFLY S	RT75	: CITE	RATURE Z	DEE DEE	SCHEE W	FSI	
5.	FAM:	HEADER S	SIZE	TEMPE	RATURE	FRE	SSURE _	PSI	
					•			•	
RATE) CAPACIT	Y: MAX E	BTUH IN			· 			
		MAX E	3TUH OUT						
CUNTI									
	CUN	DI 110N					PAC	Challed Wes	Kan
PLANT (AUXILIARI	ES:			U		1 COAL	015442	53CC.
PUMP:	3: HW	1) 480/3	3/60-3	<u>8</u> a	//2HP		4- Carb	361E	_
		2)/_	_/	A	HP		mp. Zat		
6	HM COND	- 1) 480/	3/603	MAH		R	-A:14.97	@Comp. 3	Phase
		2)/_	/	A	HP	<u></u>	RA: 90 S	(e) Comp. 3	rage
FANS		1) /	/	. Д	нь	· iā	CEM (Cord Fans	_
1 ANG	,	2)/-	_/		HP	 	CFM	3 at 1.3	FLA
		3) /	/	A	HP	9	CFM	0.33 H	<i>የ</i> (1
<i>3</i>	. ••				•				
	OTHER	1)/_		A	HP			•	
		2)/_	/	A	HF	•	•		
AUV OO	SDATING C	cuenu ec.				•			
HUX UP	ERATING S			2) ON	nee				
FUIT	CUND	1) ON	OFF OFF	2) ON	OFF				
FANS		1) ON	OFF	2) ON	OFF	5/ON_	OFF		
OTHE	₹:	1)ON	OFF	2) ON	OFF				
AUXI	LIARY FUE	L USED:	#2 OIL	NA	AT GAS	CTHE	F'	_	
		•	*-VALUE	15 LELL	LING				
)			- OPTERA						
S./ Blda N	<u>819</u>	2	POSITI	OUE/2	TYPE	Pao	e 13 of	13	
			•		•	3			

GENERAL ENERGY CONSERVATION OPPORTUNITY CHECKLIST

Bldg Name: 1/5 MTCEFAC Bldg #: P8142 Contact: SFC KIESBEDPhone #: X 5760 Surveyed By: PK Date: 12-12-84

ECO TITLE	ANNEX A	DATE	ANNEX B	DATE	COMMENTS
INSULATION	Al		# B01		NA
STORM WINDOWS OF DOUBLE GLAZING	A2		# B02		NA
WEATHER STRIPPING and CAULKING	A3		# B03		N/A
INSULATED PANELS	A		# B04		N/A
VESTIBULES OF REVOLVING DOORS	A5		# 805		NA
LOAD DOCK SEALS (Strip Door or Air Cu)			B06		NA
REDUCTION OF GLASS AREA	N N		B07		N/A
REPLACE KITCHEN LIGHT FIXTURES	A8		# B08		N/A
SHUTDOWN DHW or MOD CTRLS (Non FH)	A9		809		N/A
REDUCE LIGHTING LEVELS	A10		# B11		WA HID IN PLACE
REPLACE INCANDESCENT LIGHTING	A11		# B12		DIA NONE
USE MORE EFFICIENT LIGHTING SOURCE	Al2		# B10		NA PRESENT
HIGH EFFICIENCY MOTOR REPLACEMENT	A13		B13		
NIGHT SETBACK/SETUP THERMOSTATS *	A14		# B14	·	WA PREENT
INFRARED HTRS (Motor Rep Shops & Whse)	A15		# B15		? IN HIGH VENT RATES
ECONOMIZER CYCLES (Dry Bulb Type)	A16		# B16		MANUAL RESET ON OA
CONTROL HOT WATER CIRC PUMP *	A17		# B17		Possible
FM RADIO CONTROLS	A18		B18		N/A
RADIATOR CONTROLS	A19		B19		N/A
DECENTRALIZE DHW HTRS (POU Htrs) *	A20		В		N/A HI-M CENTRAL IN PLACE
HEAT RECLAIM From HOT REFRIG GAS	A21		# B20 .		N/A
REDUCE AIR FLOW *	A22 ·		# B21	1 300	· MOSEIBLE ->
PREVENT AIR STRATIFICATION *	A23	<u></u>	# B22		POSSIBLE
INSTALL TIME CLOCKS	A24		B23	ļ	INPLACE
CHILLER REPLACEMENT	A25		В		NA
REPLACE ABSORPTION CHILLER	A26		B38	<u> </u>	N/A
INSULATE STEAM LINES	A27		B26	 	N/A
RETURN CONDENSATE	A28		B27	 	NA :
TRANSFORMER OVERVOLTAGE	A29		B31 B30	 	143
TRANSFORMER LOADING	A30	1.			
REVISE OR REPAIR HVAC CONTROLS	A31 A32	 	B32 B33	 	GOOD CONDITION
WASTE HEAT RECOVERY * ADD ADDITIONAL LIGHT SWITCHES	A33	<u> </u>	B35	 	IN PLACE
HVAC INIT/BLDGS WITH SEPARATE BOILERS	1 A34 -	ļ	# B37		NA
STANDARD SOLUTIONS for EXT LIGHTS	A35	1,	# B36	 	7
BOILER OXYGEN TRIM CONTROLS	<u> </u>	1	"B24		N/A
REVISE BOILER CONTROLS	Â		825	 	NA
PRE-HEAT DHW	Â	-	B28	 	N/A
HEAT PUMPS	Â	1	# B29	 	N/A
EMCS EMCS	l â	 	B39	 	SEPARATE STUDY
HOT WATER RECIRC PUMPS	T A	 	M40,17	 	7
HPS STREET LIGHTS	Ä	†	M41 -	1	QUARTZ IN MAINT. BAYS
ELECTRIC OUTLET INSULATION	A		M42	 	N/A

<*> Denotes ECO's studied by Burns & McDonnel
<#> Denotes ECO's common to Military Family Housing

Denver • Colorado Springs • Atlanta • West Germany

JOB FTC EEAP UPDATE	#2102-001
SHEET NO.	_ OF
CALCULATED BY	DATE 10 -29-92
CHECKED BY	_ DATE

SULAR WALL STUDY

#8142: MON-FRI 07:00 TO 163:0

#8030 : 24 hr/Day, 7 Days/will

#8300: MON-FRI 0700 TO 1700

SOURCE: AFZC-EM /W. WHITE & STIEVESNYDOR-

AND CONTROL NAMES OF THE RESIDENCE OF A STATE OF A PROPERTY OF THE STATE OF THE STA

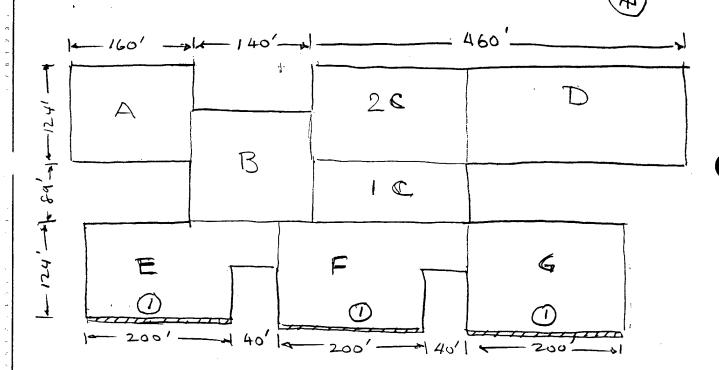
Denver • Colorado Springs • Atlanta • Germany

P-8030 BLDG DATA.

JOB FTC, ERAP UPDATE	#2102-001
SHEET NO	6
CALCULATED BY DATE	10-29-92
CHECKED BY DATE	

DIRECT SUPPORT MAINTENANCE FACILITY

- , WILL BE INCLUDED IN THE UCS W/DDC WATEOLS IN 93.
- . BLOG OPERATING SCHEDULE (OCCUPANCY) 24 HR DAY 7 DAYS /WK.



KEY PLANFORM ELEV = 5,818

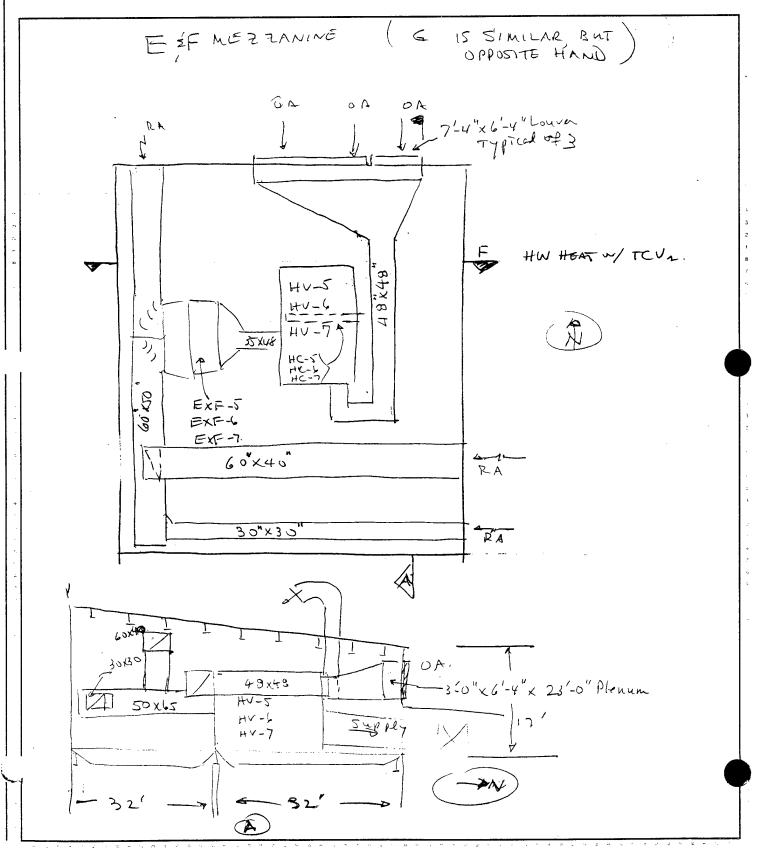
APPLY SOLAR WALL TULLI

Denver • Colorado Springs • Atlanta • Germany

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	140' 220' 40' 40' 220' 40	
32' (SUX AP WALK)	120 140 140 150	

Denver • Colorado Springs • Atlanta • Germany

JOB	
SHEET NO.	3. of 4
CALCULATED BY TF	DATE 10/92
CHECKED BY	DATE

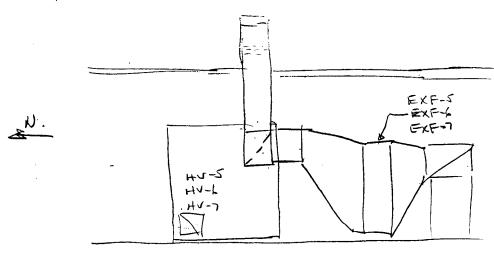


SCALE _

Denver • Colorado Springs • Atlanta • Germany

JOB	
SHEET NO.	4 of 6
CALCULATED BY TF	
CHECKED BY	DATE
SCALE	

EZF MEZZANINE (G. 15 OPPOSITE HAND.)



MECH SCHEDULE

ALL DATA FOR GOOD FT. ANTITUDE.

HV-5,647

47,000 CFM SUPPLY & EXHAUST 31N, H20 SP, SUPPLY FAN 3:1N, H20 SP EXH FAN

HEAT WHEEL THERMAL Eff (at Scalevel) = 7/90 (INOP)

HC-1, 2+3

422,000 BTUH

EAT=40°F AT= 35°F

6PM= 77

47,000 CFM 3" H20 SP.

HV-7

EXF 5 47,000 CFM

EXF 6 3" H,0 S.P.

EXF ?

Carl Carlotte Control of the Control

T.F.	6	UFG
1.5	9	900

	EXT WALL SECTIONS, FUR	
ranging additional cell additional and branch desirable amounts hill defined and high are resistant and a	SOLAR WALL	
The second section of the section of the		
	BATTINGUL. 1/2"	
44 Deepribbel	METAL LINER PANEL	
notal panel		
notal panel (Exterior)		
'		
i i i i mani an iga anna mama maman i in in in i i i i i i i i i i i i i		
	and the second of the second o	
	POUF	
The second section of the second section of the second section section section section section sections.	BUILT UP ROOFING OVER RIGID INSUL (6")	
Company of the Compan	SOUR REALD MOSAC, (C)	
		-
	1/2 " metal deck.	
Maka karang sadaks sakangga ngahilik dalamin sa ang karang saka sakan sakan sakan sakan sakan sakan sakan saka		
colonic and the same and data adding the business who have been determined to the same one of the same determined business business.		
The second secon		
, tradit a district de district de l'estimation de l'étable de la page de relation de la company de la company de l'étable de la company de la		